
Climate change
and
sustainable development
Ethical perspectives on land use and food production
edited by:
Thomas Potthast
Simon Meisch

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Simon Meisch

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Preface

A common perception in Europe seems to be that climate change is something that we are to expect in the future. Yet, if one moves the attention to developing countries of the (global) south, e.g. to South-East Asia, climate change becomes the name of, for example, adverse weather conditions that people struggle with already now. While rich countries still debate proper mitigation efforts, perhaps slowly moving towards measures of adaptation and resilience, the poor countries in the world focus on justice in damage compensations and controls, and restoration efforts – a debate that potentially involves burden sharing with a special responsibility of the rich countries since their lifestyles mainly caused the problem in the first place. Nowhere is this more evident than in the food sector.

Climate change is the major framing condition for a sustainable development of agriculture and food production in a double sense. Global food production on the one hand is a major contributor to global greenhouse gas emissions, and thus amplifying climate change. On the other hand, global food production is also among the sectors that assumedly is worst affected by climate change. Ongoing changes in and of land-use practices on local, regional and global scales – often dubbed as 'glocal' situations – are placing a particular strain on sustainable development. Forestry and fisheries are similarly affected, thus adding to the number of people who are directly affected.

In this context, agricultural and food ethics (and adjacent fields) once again need to address well known, but aggravated 'old' problems. These are, among others, desertification boosted by temperature increase, changing precipitation regimes, unsustainable and/or unfair land-use and water regimes, pressure on arable land due to the loss of coastal areas, soil degradation and suburban sprawl, and the strain placed on both environment and animal welfare as a consequence of a growing worldwide demand for animal products. Furthermore, the promise of new technologies to pave the way towards sustainable food production and food security needs to examined critically and evaluated ethically. Certain consumption patterns may become more and more unbearable in the light of global sustainability. All these phenomena and their manifold socio-economic implications on justice and fairness need to be investigated and reflected on from ethical perspectives.

At the same time, however, climate change also creates some specific difficulties: There are and will be new irreversible changes of natural and anthropogenic systems, which are associated with a high degree of uncertainties with regard to their consequences. Furthermore, mitigation and adaptation measures to counter or slow down climate change have already resulted in considerable changes in agri- and silvicultural land-use. This is mainly but not only due to the significant increase in growing plants for energy supply ('biofuels'). Another perspective is the purchase or long-term tenancy of arable land or of water rights in the countries of the global south by wealthy nations and by transnational enterprises. In the case of animal production, specific dilemmas arise when a narrow focus on carbon efficiency favours intensive production systems which are decoupled from traditional agricultural considerations. The coupling of demands of high efficiency in food production systems with demands on ecologically and socio-economically sustainable practices places particular challenges to future developments, also in the light of the global nature of food trade and markets. Finally, citizens' values and preferences in regard to both governance frameworks as well as lifestyle and consumption patterns with regard to adaptation and mitigation will in any case be crucial for choices that will dominate the marketplace as well as industrial and political realities.

These issues are exemplary of the many dimensions which demand reflection from an agricultural and food ethics perspective. The community of scholars involved in the *European Society for Agricultural and Food Ethics* (EurSafe; www.eursafe.org) is in particular challenged to mobilize their competencies

and creativity in order to contribute to ethically sound pathways to sustainable food production and consumption. The mission of EurSafe is to bring the ethical dimensions of agriculture and food and their respective contexts to the fore, make them subject to scholarly debate and public democratic deliberation. Previous meetings were successfully held in Bilbao (2010), Nottingham (2009), Vienna (2007), Oslo (2006), Leuven (2004), Toulouse (2003), Florence (2001), Copenhagen (2000) and Wageningen (1999). The 10th EurSafe Congress has been dedicated to the spectrum of themes around climate change and sustainable development. Thus the holding of this Congress in Tübingen marks an important step towards anchoring EurSafe within a global agenda. Its overarching theme calls for contributions from various academic disciplines, from all walks of life and from all cultures. Tübingen is set to provide the ideal meeting forum for fruitful discussions in a peaceful and relaxed, but also intellectually stimulating atmosphere.

In Tübingen, EurSafe for the first time gathers for a conference in Germany. The city hosts Eberhard Karls Universität that, being found in 1477, belongs to the oldest and most prestigious German universities. Both city and university are known for their commitment to action with regard to climate change. 'Tübingen macht blau' is the motto of a campaign by which the City of Tübingen successfully is on the way to reduce greenhouse gas emissions. Since 2011, Tübingen University is the first university in Baden-Württemberg and one of only few larger universities in Germany adopting a voluntary environmental management regime (Eco-Management and Audit Scheme; EMAS) in order to continuously improve its environmental performance. Both campaigns are not only top-down approaches but also supported by citizenship and university members, respectively. Hence, the conference takes place in a wider social context that is committed to climate protection.

EurSafe 2010 has been organised by the International Centre for Ethics in the Sciences and Humanities (IZEW). Founded in 1990, IZEW is an interdisciplinary and interfaculty unit of Tübingen University devoted to the whole range of application-oriented ethics research and teaching. It shall be worth noticing that the roots of the Ethics centre have to do with one of the central themes of EurSafe: since 1985 both professors and students established structures for debating the use of genetic engineering in medicine and agriculture from the perspectives of technology assessment and ethics. The first interdisciplinary dissertation submitted in the department of biology was devoted to an ethical evaluation of herbicide resistant transgenic crops. Many other projects followed, e..g. one on *Bacillus thuringiensis* toxine of transgenic plants for crop protection, one on stock breeding of transgenic husbandry and one on perspectives on biotechnology and food. To date, the working group 'Nature and Sustainable Development' addresses agricultural and food issues in the context of global change and biodiversity – hence in the broader picture of sustainability. Representatives and staff of IZEW have been honoured by the decision of EurSafe to hold its 10th conference in Tübingen. They are more than happy organising the meeting and to gain insights from the excellent contributions as well from networking with scholars from a range of almost 20 countries in Europe and further abroad.

This conference volume brings together some 80 papers, almost all conference contributions of the regular oral presentation format. The themes and perspectives are manifold. As introduction and overview, general issues of climate ethics and sustainability, of the anthropological-political dimension of animal ethics, of environmental, agricultural and food ethics and of governance are raised. One further line of themes is linked to global questions of property rights and commons, of debates on global warming and climate change, the ensuing ethical issues of adaptation and mitigation as well as of non-agricultural land-management. A second line treats the contested question whether – in the light of climate change – intensive or extensive production shall be sought. Here animal welfare, efficiency and environmental implications are discussed. Another topic of high significance linked to this land-use issue is, of course, agro-energy. In a third line, food policy and broader contexts of food and nutrition are at stake, including one of the major future issues (not only) of protein recruitment, i.e. fish for food

and, more generally, food and sustainability. The latter already is linked closely to the fourth line, the societal perspectives on consumers and consuming, on science and governance and, again more broadly, values for governance. In regard to the fifth line we expected many more contributions on the issues of biotechnology, both in agricultural production and on the food sector. What we instead found is that questions of animal ethics have in comparison gained much more attention. Last but not least, ethics teaching, ethical methodology and learning instruments are presented and discussed.

This volume cannot cover the whole range of themes around climate change and sustainable development. For example, the issue of food waste is not present in this volume. However, the diversity of contributions will provide important insights into the contested ethical issues of agriculture and food security in the light of global change and shifting land-use patterns. The authors of the papers form a diverse community of academic scholars, public sector professionals, representatives from industry and non-governmental institutions. It is part of EurSafe's policy that a variety of ethical approaches and standpoints are expressed in this book.

The contributions in this volume have been peer-reviewed by the scientific committee before being accepted for presentation at the congress and for publication. The editors are deeply obliged to the colleagues who provided their expertise as reviewers. They also want to express their gratitude to the team members of the organising committee and to Mike Jacobs from Wageningen Academic Press for untiring help in the editing process. Last but not least we want to thank all the contributors to this book for providing a broad spectrum of high-ranking and stimulating papers. We are convinced that the present volume will contribute to carve out pathways of sustainable land use under conditions of climate change. Advancing the perspectives of agricultural and food ethics is becoming more and more of a crucial necessity in this effort.

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Keynote contributions

Domains of climate ethics: an overview

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Abstract

Climate change is full of moral questions. These questions have been addressed by different scholars in recent years. Meanwhile, 'climate ethics' is an established sub-discipline within practical philosophy. This field aims both at critical reflection but also at moral orientation for climate policy making. The article gives an overview on the topics of current climate ethics. It addresses mitigation, adaptation, and the prospects of different types of geo-engineering. Within the domain of adaptation, some remarks on agriculture are made. The article argues for an enlarged and refined concept of 'contraction and convergence' which should guide international climate policies.

Keywords: mitigation, adaptation, geo-engineering, agriculture

Introduction: the ethical profile of climate change

Anthropogenic climate change is not repugnant in itself. Climate change is a moral problem because of its negative impacts on human systems (and on biodiversity) in the short, middle and long run. People who will be affected by Climate change are not just members of future generations. Since climate change already has begun, people affected are a) contemporary adults, especially in poor strata of countries of the global South, b) contemporary children whose life overall prospects are affected for worse, and c) members of future generations. Climate change is a paradigm case for intergenerational responsibility since, once induced, it will continue for centuries. The ethical literature on responsibility towards posterity can be applied to the case of climate change.

Dealing with the broad field of Climate Ethics (CE) it seems reasonable to distinguish different domains (cf. Grasso (2007). A comprehensive CE will be established if well-substantiated positions in each domain can be conjoined coherently. At its core, CE refers to a triangular structure of how to reduce the negative impacts of climate change by (a) mitigation (reduction of greenhouse gas emissions); (b) adaptation; and (c) climate engineering. Some sections of the article refer to this general structure, the overall article also deals with other important topics of CE. On large time scales the global climate is permanently changing. On a short time scale of ≈200 years, humans contribute to the natural greenhouse effect by releasing CO_2 and other so-called greenhouse gases (GHG) into the atmosphere. GHG concentrations can be defined in terms of CO_2 only or in terms of all GHG which are calculated in CO_2equivalents (CO_2-eq). In the following, we adopt the CO_2-equivalents numbers. Due to human release, atmospheric concentration of GHG is now ≈390 ppmv CO_2 and roughly ≈430 ppmv CO_2-eq.

Ethical suppositions in climate economics

Economists do not wish to avoid climate change at any cost. Standard economic approaches rely on the idea of maximizing net present value. The paradigm calculation is William Nordhaus's 'classical' DICE-model (Nordhaus, 1994). Björn Lomborg (2001) uncritically relied on Nordhaus' calculations. Richard Tol continues this efficiency approach (EA) in his many publications in which he downplays the moral problems of climate change (e.g. Tol, 2008). The so-called Stern-Report (Stern, 2007) provides results on mitigation policies different from EA. One important modification is a discount rate close to zero (0.1% p. a.). Due to a low rate of discount, future evils are represented in the net present value to

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almost full extent. Setting the discount rate close to zero might be a reasonable choice from the moral point of view, as ethical reflections on discounting indicate (cf. Hampicke and Ott, 2003), but it is not based on purely economic grounds. Both Nordhaus and Tol criticize the Stern-Report for using such a low rate of discount.

The problems of EA increase if not only mitigation but adaptation and climate-engineering are addressed. If EA can't calculate the efficient solution for mitigation policies it can't calculate *a fortiori* the efficient solution in the triangular affair in between mitigation, adaptation, and modes of climate-engineering. To determine the 'efficient' solution of mitigation, adaptation, and climate-engineering in a global welfare function over a century is, at best, an utopian ideal and, at worst, a misleading, dangerous, and chimerical myth. By searching efficient solutions our moral concerns might be blinded by economic science

The debate on the ethical assumptions within EA motivates many (prudent) economists to adopt an alternative approach, the so called Standard Price Approach (SPA). This approach starts from a standard set by some legitimate authority. The primary task of economics is to calculate how this standard can be reached by minimizing costs. SPA does not answer the question how to determine such standard with respect to atmospheric greenhouse gas concentrations. The neutrality of ethics – understood as a reflexive approach to the moral point of view and specific issues of moral action – in regard to particular interests implies that ethics is in an 'objectively' better position to determine such a standard than the perspective of rational self-interested agents within strategic bargaining processes. Within a Rawlsian approach, one may ask which climate policy a rational person would adopt behind the veil of ignorance if this veil covers the spatial and temporal location of one's life on a planet whose climate is changing.

Stabilization level of atmospheric greenhouse gas concentration

Art. 2 of the United Nations Framework Convention on Climate Change (UNFCCC) defines the ultimate objective of this convention and of all related protocols to stabilize atmospheric greenhouse gas concentration at a level that prevents a dangerous anthropogenic interference with the climate system. This objective itself has three normative constraints which we leave aside here. Some years ago, a study on behalf of the Environmental Protection Agency outlined an ethical argument in favour of very low GHG stabilization levels. The study compared CE approaches that argue from within different ethical theories (Ott *et al*., 2004). Almost all approaches except ethical contractarianism came to the conclusion that there is a moral commitment to curb global GHG emissions in order to reach as low as possible GHG stabilization levels. Thus, one can argue with some confidence that despite all controversies, most current ethical theories demand stabilization of GHG at the lowest feasible level. This is, indeed, a remarkable convergence of different theories that should not be ignored by politicians.

Distribution schemes for remaining emission entitlements

Any stabilization target raises the problem of how to distribute the remaining sink capacities (or carbon budget) fairly. If one assumes, first, that the atmosphere has the status of a *global common pool good*, and if one, second, adopts the Rawlsian intuition on justice that all goods should be distributed equally unless an unequal distribution benefits all, egalitarian schemes deserve special attention. A substantial argument in favour of egalitarian distribution has been made elsewhere (Ott, 2010).

An egalitarian scheme would mean that each person is given the same carbon budget which she can emit per year. There are different proposals of how to deal with such budgets. In most proposals, the budgets can be traded freely on carbon markets. If properly implemented, such an egalitarian scheme has the welcome effect that persons with low emissions (e.g. in India, Africa) will be benefited because they can sell their entitlements.

Responsibility for historical emissions?

Northern countries started to emit GHG in the course of industrialization and filled up the common atmospheric sink until the 1960ies. Now, Southern countries claim that the polluter-pays-principle must be applied and that there is a huge *historical debt* of the North against the South. But causal responsibility does not imply moral responsibility. In the remote past, almost all persons were ignorant about the causal relation between GHG emissions and climate change, which was established only for decades. So we can't blame our ancestors for burning coal and drilling oil. Historical emissions are harmful, but not wrongful.

Nevertheless the legacy of the past should be a reason for citizens of the North to recognize themselves as being *beneficiaries* of past emissions, to agree that past emissions turn out to be harmful, to agree to some duty to compensate victims and, finally, to adopt the attitude to assist countries in the global south in the fields of technology transfer and adaptation (Caney, 2006; Gosseries, 2004). We should not try to calculate historical responsibility sharply but should take the proper moral role of wealthy and privileged beneficiaries.

Adaptation opportunities

Humans are practical beings with large capacities for problem solving. These capacities can be used for adaptation. The concept of adaptation must be secured here against biological definitions of adaptation of organisms to a competitive environment. If not, adaptation to climate change would be seen as an instance of survival of the fittest. Instead, the notion of adaptation encompasses a broad spectrum across different dimensions of societal life.

Rich countries can utilize scientific knowledge, financial capital, political administration, and infrastructures in order to implement adaptation strategies on their own. The situation is different in Southern countries were many institutional preconditions for effective adaptation are lacking. It is very likely that there will be adaptation funding for Southern countries under the UNFCCC regime. Privileged beneficiaries have some obligation to assist adaptation in less privileged countries. It should, however, be asked whether such assistance should be additional to ordinary development aid (ODA) as most NGOs suppose. This problem is not addressed here since such debate relies on assumption of how good or bad the 100 billion $ ODA are spent each year. It remains doubtful whether strict emission reduction (80-90% compared to a 1990 benchmark), doubling of ODA (0.7% GDP), and additional burdens for adaptation funding gradually become somewhat overdemanding even to rich societies that have to deal with many other problems than just climate change. By intuition, the most vulnerable and marginalized groups should be the first beneficiaries of adaptation funding. It can't be denied that vulnerability is an important criterion for funding priorities. But if this criterion remains unbalanced by other criteria a perverse consequence may result. Imagine countries of the South must compete for money against each other under a vulnerability criterion. If so, there is an incentive to present oneself as poor, helpless, ignorant, devoid of capabilities and initiative, and so on. If such outcome is to be avoided the criterion of vulnerability should not be the only one. Many poor people do not live in misery but use their indigenous knowledge to reproduce a decent livelihood. Why not allocate the lion's share of adaptation spending to communities that have sustained a non-miserable livelihood for generations and might continue to do so even under climate change impacts? Adaptation funding should reward and stimulate activities by which adaptation is linked to other objectives of sustainable development. Thus, global adaptation spending should support and stimulate such activities that combine local adaptation, biodiversity conservation, ecosystem restoration, and carbon storage. Sustainability science could assist and assess such 'eco-carbon' activities in participatory case studies.

Adaptation should focus on agriculture. The relation between climate change and agriculture has been intensively debated in recent years (Brouwer and MacCarl, 2006; Fischer *et al*., 2002; KIT, 2011; Lobell and Burke, 2010). Since we are not experts on agriculture, we restrict ourselves to some widely agreed claims:

- Reduction of agricultural GHG-emissions (fossil fuels, fertilizers).
- Prudent carbon management of soils (carbon enrichment) and of moisture.
- Soils should be carbon sinks and should not become carbon sources.
- Focus on regional and local food security, not on global yields.
- Implementation of water saving irrigation schemes in arid regions.
- Reduction of virtual water exports from global South to North.
- Reduction of yield gaps in a sustainable way.
- Reduction of loss and waste of food.
- Critical perspective on bio-fuels, patents on seeds, and on large scale land acquisition ('land grabbing').
- Shift to more vegetarian diets (North) or continuity of such diets (South).
- Political support for organic agriculture in both North and South.

Climate engineering

In his last publications, the mastermind of nuclear deterrence, Edward Teller, proposes solar radiation management as a technical measure against climate change (Teller *et al*., 2002). Accordingly, a doubling of CO_2-concentrations could be compensated by a decrease of roughly 2-3% of solar radiation reaching the surface of planet Earth. Solar Radiation Management (SRM) is one type of climate engineering, Carbon Dioxide Removal (CDR) is another one. The effects of CDR are promising but rather slow. The profile of SRM is different. Most attention falls upon one specific SRM-option: continuous release of large amounts of sulphate aerosols into the stratosphere. This option seems attractive to some scientifically credible scholars especially in the United States (Blackstone and Long, 2009; Keith *et al*., 2010). Also influential think tanks that supported climate skepticism some years ago quickly shifted toward SRM-enthusiasm. The message is often quite simple: If there is a quick, cost-efficient, effective technological solution (as SRM) to the problem of climate change by which a decline in economic growth and a change in consumerist lifestyle can be avoided, the US should not hesitate to go for such solution. Sometimes it is added that the problem of global cooperation in mitigation GHG can be easily turned into a technological joint effort problem. SRM fits frightening well within the profile of the most questionable variant of contemporary capitalism and its military-industrial complex. Launching SRM as an economic-political project will discourage investments in carbon-poor economics. Moreover, there are risk-based ethical concerns against sulphate-based SRM. Once fully deployed, SRM can't be easily stopped if it is not combined with stringent mitigation. SRM, however, once tested in large field tests and fully deployed may realize itself as 'a replacement' of mitigation efforts. If so, reversibility of SRM must be seen critically. The effects of SRM on agriculture are uncertain. Some studies suggest a reduction in precipitation. All arguments considered, CDR should be researched and tested in the field, while SRM might be researched only theoretically by experiments and modelling. There is some evidence that strong mitigation, CDR, prudent adaptation and nature conservation can be combined to win-win-strategies. The opposite trajectory avoids strong mitigation in the short run and may turn into SRM in the longer run. This is a difference that makes a moral difference.

Contraction and convergence versus *greenhouse development rights*

The two already mentioned competing concepts in CE are Contraction and Convergence (C&C). The core idea is presented in Meyer (1999; for further development see the website of Meyer's 'Global Commons Institute') and Greenhouse Development Rights (GDR; Baer *et al*., 2008; see www.ecoequity.org). The

position adopted here is clearly a variant of C&C which is augmented by some ideas on adaptation beyond the vulnerability criterion, some hopes for CDR, and strict *caveats* against SRM.

The GDR concept supposes a global emergency situation and combines strict mitigation with mandatory assistance to adaptation in the global South and with a benchmark in monetary income below which persons have no obligation to curb their GHG emissions or care for climate change. The charming idea that rich persons in poor countries should contribute to mitigation and adaptation efforts is not at the heart of GDR-concept. A human right to develop is seen as a right to create monetary income This right to create monetary income is placed at the centre of the system of human rights.

The concept of C&C as proposed by Meyer (1999) includes a gradual convergence from now to 2050, which seems both feasible and fair. Such a scheme puts a mitigation burden even on countries like China. The heaviest burden clearly falls on states whose economics have been based on cheap energy, as the U.S.

While C&C allocates resources, GDR allocates burdens. Under the criteria of responsibility and capability, the burdens of single states are calculated. As result, the burden of states as Germany, the USA, and other wealthy industrialized states becomes greater than 100% emission reduction. Even if these states reduced all GHG emissions to zero there remains a financial burden to assist Southern countries to adapt. On the other side, economics which do not convert GHG emissions into income efficiently will be benefited under a GDR regime. To us, the attractiveness of GDR has faded at a closer look (Kraus and Ott, 2009). It combines an emergency ethics with a conventional approach to development to a measure which creates results that look somewhat overdemanding in a macroeconomic perspective.

For Northern countries, the economic impacts of C&C are severe but viable under a prudent long-term transition management. Germany could reach 100% electricity supply from renewable before 2040 if there will be close cooperation with Scandinavian states (SRU, 2011). There are reasons to claim that a C&C-concept that must be enlarged to the domain of adaptation and might adopt some important points from GDR is, all things considered, the 'better' concept.

Conclusion

The triangular affair between mitigation-, adaptation-, and climate-engineering-strategies should not be seen as a portfolio. Within this triangular affair, mitigation deserves priority because mitigation is a precondition for adaptation and CDR being successfully performed. Mitigation on a global scale is by no means utopian any more. If the course of action will be agreed upon and become a safely paved and reliable pathway, the speed of taking steps may be increased up to running.

Climate change raises huge challenges for agriculture but there is no time for despair yet. Under a global C&C regime, agriculture could be adapted to modest climate change and, by doing so, be transformed into a more organic and sustainable 'Gestalt'. Adaptation and transformation are two sides of the same coin.

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The global governance of climate change, forests, water, and food: normative challenges

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Abstract

Global negotiations in a number of different areas show that power politics often determines negotiation outcomes. This raises a number of ethical challenges. This paper, hence, addresses the question: 'What are the normative challenges at global level in the context of climate change, water, and forests and what does this imply for food?' This question is addressed through short case studies on the climate change negotiations, water negotiations, and forest negotiations which discuss the link of each with food, the key ethical issues involved, the state of current governance, and draws inferences for the food regime. It argues that the existing inequities in the food regime globally and locally will be exacerbated by the impacts of climate change, water and forest governance on agricultural productivity. This may, to some extent, be resolved through advances in technological knowledge; but such advances may not necessarily address the distribution problem which is at the heart of normative challenges. The paper argues that one way to try and solve these distributional problems globally, is to promote the adoption of a global constitution and the rule of law.

Keywords: power politics, ethical issues, distributional problems, rule of law

Introduction

The rule of law concept refers to the application of general principles in a predictable manner to all situations – it is often contrasted with the rule of a king or a powerful leader. While the rule of law concept is considered as very important at the national level in most developed countries and is promoted actively in the developing world by the developed countries, at global level the rule of law project is very incomplete. Many powerful countries (such as the US) see the international arena as 'anarchic' and do not wish to give up their sovereignty to a global decision-making process. As a result, the global arena is characterised by ad hoc rules that are generally taken to support the interests of hegemonic actors (cf. Simpson, 2000). This is particularly evident in the case of climate change. This implies that countries prefer issue-specific rules rather than ethics based principles at global level.

Against this background, this paper addresses the question: 'What are the normative challenges at global level in the context of climate change, water, and forests and what does this imply for food?' This is answered through short case studies which discuss the link of each with food, the key ethical issues involved, the state of current governance, and draws conclusions for the food regime.

Climate Change

Climate change and food

The problem of climate change can affect food availability, access and use patterns. It can affect food availability, since changing local climates (drought, floods, changes in growing season) and salt water intrusion can affect crop survival and productivity. It can affect access by changing the ability of local

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regions to produce for local people, or by changing the price of agricultural commodities thereby pushing it out of the reach of local people. It can affect use patterns by either forcing people to use what is available as against what they want; or climate mitigation and adaptation policy may call for a crop-switch to other crops such as from rice to wheat. Existing food problems in Africa and Asia are likely to be further exacerbated by the effects of climate change.

Climate change ethical challenges

The climate change problem is essentially a North-South issue for four reasons. First, in terms of the past emissions of greenhouse gases, the emission level of the average Northern country was substantially higher than that of the average Southern country. Second, the bulk of the impacts until 2020-2050 are caused by past emissions, the majority of which were emitted by the developed world. Third, according to UNDP (2007), if global greenhouse gas concentrations and emission levels are to be kept within safe levels – the world budget for the 21st century would be exhausted by 2032, leaving little room for the developing countries to grow – something they have been asking for at the UN General Assembly for a long time and which has been now formalized in the UNGA resolution (1986) on the Right to Develop. Fourth, the impacts of climate change will be more severe in the South – both because of the geographical location of the developing countries, and also because their vulnerability is the greatest.

The initial social contract between the developed and the developing countries was that (a) the developed countries would reduce their emissions of greenhouse gases; and (b) provide assistance to the developing countries to help them purchase more climate friendly technologies and to adapt to the impacts of climate change. This was encapsulated in the leadership paradigm.

However, by the time the Climate Convention (1992) was finally drafted, (a) the target to reduce emissions was worded in very vague language possibly not amounting to a legally binding target; (b) the help to developing countries was not in terms of targets and timetables but in terms of woolly words – the only clear paragraph being Art. 4.7 which is cited till today by the developing countries; and (c) the ethical norms encapsulated in the article on Principles – included five ideas: The common but differentiated responsibilities and respective capability principle, the right to sustainable development, the protection of vulnerable countries, the precautionary principle and the open international economic system. Yet at least two of these are contradictory (the precautionary principle is made subject to the cost-effectiveness argument; and the open economic system may contradict sustainable development). Furthermore two important ideas are excluded (the polluter pays principle and the no harm principle), and the whole was made legally contentious through a footnote!

By the time the Kyoto Protocol (1997) was adopted, (a) new targets were adopted by the developed countries, but together (1) they fell short of what was needed (both in absolute terms and also since the US has not ratified the Kyoto Protocol and Canada has withdrawn in 2011), (2) individually they include targets to *increase* greenhouse gas emissions, (3) there was an option to offset increases in the developed world through projects in the developing world; (b) the (1) bulk of the technology transfer help to developing countries was linked to emission reduction in the North (e.g. The Clean Development Mechanism (CDM)) and (2) the Adaptation Fund was created out of a tax on the cooperation between North and South in the CDM; (c) an implicit new norm on 'grandfathering' was introduced through the introduction of the emissions trading concept.

Current state of climate governance

We have reached 2012 and there are (1) no new legally binding targets; only some highly conditional pledge and review type targets; (2) if there are no new targets, the impetus to invest in the offset

mechanisms of the CDM and Reducing Deforestation and Forest Degradation (REDD) is reduced, and thereby there will be fewer resources flowing into the Adaptation Fund, and although there are new funds promised it is unclear which country and which actor will contribute and by how much; and (3) consensus references to normative values are disappearing from the agenda (Gupta, 2010).

The bottom-line is that the climate change problem has not been adequately addressed and the potential impacts from past emissions are being felt in different parts of the world, but these are, of course, subject to the attribution challenge: can these impacts be attributed to greenhouse gas emissions of the developed world?

Inferences

This implies that the impact of climate change on food availability and access is becoming further exacerbated; and as there are limited resources available for climate change adaptation, there is also limited assistance to those impacted in the 150 'non-developed' countries.

Water

Water and food

Fresh water is a key resource for food production. Between 70 and 80% of water use is for agricultural production. In fact this ratio has scarcely changed since the time of the Mesopotamian Civilization. The water system is changing partly because of the impacts of climate change (e.g. changing precipitation and evaporation patterns, rising sea levels and melting glaciers) but also because of other human activities such as dams which influence sedimentation patterns and soil fertility, and changing land use patterns. Since the world population is expected to increase by about 40% in 2050, there will be an increase in the demand for food and feed.

Water ethical challenges

Water is governed from local through to global levels. I will only discuss the issues that arise from transboundary to global water use and only in relation to the non-navigational uses. In relation to the transboundary use of water, the key issues are regarding who has the ownership and/or user rights over the water, how can water be shared between countries, and how can responsibilities regarding the management of ecosystem services be allocated between countries.

At regional level, two case studies may illustrate some of the normative challenges. The Nile passes through 11 countries and flows via Sudan into Egypt before emptying into the Mediterranean Sea. Colonial and post colonial agreements between Sudan and Egypt provide the bulk of the waters of the Nile to these two countries, a division that is highly contested by the upstream countries. In order to question this division and to address the problem of equitable sharing of the Nile waters, the Nile Basin Initiative and the Cooperative Framework Agreement have been launched; and the current political changes in Egypt, the split up of Sudan and South Sudan, and the building of the Grand Millennium Dam may provide a political window of opportunity to renegotiate the sharing of the Nile. Another case study is that of the Mekong which flows through China via Myanmar, Thailand, Laos, Cambodia and Vietnam. The equitable sharing and management of the Mekong River is currently being governed by the Mekong River Commission, but China and Myanmar are not members. As an upstream country with considerable political and economic power, China has the ability to increase its water access and pollution without taking into consideration downstream needs. The challenge is to find ways to include the upstream countries into the joint management of the river.

At global level, the 1997 Watercourses Convention aimed to codify rules regarding the sharing of watercourses and has six criteria for water sharing between countries, only one of which refers to past use. It also has criteria for not causing harm to other countries. However, this Convention has yet to enter into force, and climate change has not yet been mainstreamed into this or other transboundary water agreements.

Current state of water governance

The current state of water governance is that we have a global treaty that is not in force, we have a number of water related initiatives (e.g. promoting integrated water resource management) taken by a vast number of UN and non-UN agencies that have some influence and we have the 2010 UN General Assembly Resolution on the Human Right to Water and Sanitation. At regional level we have hundreds of treaties – and although in the UN Economic Commission for Europe region, the treaties are developing a normative framework for dealing with water, in other regions of the world, most treaties are highly contested in terms of equitable utilization, flood water management and pollution control and have not yet taken climate change into account.

Inferences

The key norms for water governance in relation to access (the human right to water and sanitation), equitable utilization (the sharing of water resources among riparian users), and the no-harm principle (the use of water such that harm to states is minimized) have been articulated and codified, but are yet to be effectively implemented because of regional politics. The management of risks (flood risks, and the risks of climate change impacts) have yet to be taken into account.

Forests

Forests and food

Deforestation and forest degradation are very much in the news today. A key driving factor behind deforestation is the need to expand agricultural land. At the same time, the relationship is not one-way. Forests provide bushmeat, fruits, nuts and honey for rural communities; they provide ecosystem services which regulate hydrological services for irrigation use, absorb greenhouse gases, minimize the impacts of extreme weather events on the landscape, may enhance pollination in nearby fields and some forests (mangroves) reduce the potential for salt water intrusion; and income to local communities so that they can buy food. At the same time, forests are also impacted by changing climates.

Forest ethical challenges

The ethical challenges at global level with respect to forests concern firstly – whose forests are being governed? Forests typically fall under national boundaries and the question is – can foreigners dictate how a country manages its land use? This is especially important in relation to the fact that those who have already deforested tend to turn a finger towards those who are currently deforesting to ask them to stop doing so. This is one of the critical reasons why there is no real effective global forest governance regime today.

The fact that deforestation may contribute about 17% of global greenhouse gas emissions has brought attention back to the deforestation issue; this time the idea is that emission reductions in the forest arena can be used to offset emissions in the developed world. Afforestation and reforestation projects qualify as CDM projects, while reducing deforestation qualify as REDD projects. Apart from the dubious

ethics of offset policies, there is another issue here. How will developing country governments actually implement the forestry policies? Will this lead to labelling some land as forests and thus impacting on the right to sell of local landowners? Will this lead to a negation of community rights to use and manage forests? Or will this lead to a true compensation of forest ecosystem services for local people via the payment for ecosystem services (PES) concept. What effect will this have on the local availability of land for agricultural purposes or on the local access to food sources within forests?

Experiences from the past (e.g. Debt for nature swaps) suggest that there is many a slip between the theoretical idea and the practical implementation. While in theory many of the ethical aspects can be resolved, in practice – those who are expected to pay may not wish to pay, a PES scheme is considerably more expensive than a Protected Area scheme, ownership rights to forests are highly disputed and the local community is often difficult to identify, find and compensate.

Inferences

The key norms for emerging forest governance are sustainable forest management, forest ownership rights and payment for ecosystem services. But all of these are highly contested in the practical world of forest implementation. The key question is whether forest lands can be managed such that the perceived trade-offs between forests and food can be dealt with and the communities living in and around forests are not worse off.

Implications for food

Implications of the above for food

Changing climates, hydrological regimes and forest regimes may have a serious impact on global food security. Although there are attempts to address these problems using a normative framework, these norms are yet to be implemented. Although there are attempts to design solutions for these problems, the climate change regime is far from being addressed, many parts of the world are very water stressed, and deforestation and land degradation continues.

Food ethical challenges

The global governance of food itself is not without its ethical challenges. Global food governance is dispersed among many different UN agencies and agreements and World Food Summits receive relatively little global high-level attention. There is no real determination of common values and ethics with respect to food. Instead food security is negatively influenced by the implementation of food aid politics, over-production in the West and rising prices in the South, debt and past structural adjustment programmes in the South, subsidies for European agriculture and fisheries, the intellectual property rights regime, the impact of gene technology on food biodiversity, by hierarchical vertically integrated markets (e.g. on bananas) on small farmers and by the new demands for biofuel and the global recession.

Add to these existing ethical challenges, the new ethical issues raised by climate change (as to who is responsible for reducing emissions and compensating others and thereby setting a good example to emerging economies), by water (as to how transboundary water should be shared and managed in terms of its complete ecosystem services), and by forests (as to how to create an ethical and legitimate multi-level governance system to address the forestry issue) and the issue becomes much more complicated.

Inferences

While technologies may be able to ensure enough food production for all, the key problem will be whether the existing wastage of food in consumer societies can be reduced, and whether the distribution of food can be enhanced and local access and affordability of food guaranteed.

Conclusions

As the global economy increases three-fold by 2050 with accompanying demands for fancy food, as the global population increases by 40%, and as technologies make more 'consumptive behaviour' possible (e.g. travel to space, individual gadgets), global greenhouse gases may continue to rise in a business as usual scenario, average temperatures may increase by1.5-2 degrees above pre-industrial levels, water withdrawals may increase by 20-85%, 10-20% of land may be converted for agricultural use, nutrient loads may increase by 2/3rds, edible fish populations may reduce by 90% in comparison to pre-industrial levels, and plant species may decrease by 10-15% (MA, 2005).

This is likely to enhance stress between and within countries. This may lead to two choices – the first is that food, water and energy become global security issues and bring the world community together in a joint effort to address problems; or it may lead to an intensification of competition between countries. In both cases, the only way forward is to create a rule of law system and a global constitution within which countries operate: in the first situation such a rule of law system will be symbiotic with the global efforts, in the second situation, such a system will help pre-empt the breach of global responsibilities and the rise of resource conflicts and wars.

Such a global constitution could draw inspiration from the 1945 UN Charter and its emphasis on peace and security, the 1992 Rio Declaration on Environment and Development, the human rights agreements and the Millennium Development Goals and their emphasis on guaranteeing access to basic resources, and the 1997 UN Watercourses Convention and its emphasis on sharing transboundary resources equitably.

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The willed blindness of humans: animal welfare and beyond

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Abstract

This paper describes how we seem to live in a willed blindness towards the effects that our meat production and consumption have on animals, the environment and the climate. It is a willed blindness that cannot be explained by either lack of knowledge or scientific uncertainty. The blindness enables us to see ourselves as moral beings although our lack of reaction to the effects of our actions tells another story. The consequences, especially to animal welfare are outlined and it is briefly discussed whether a solution lies in a new moral vision of our obligations or a new vision of what a good life is. The second option is identified to be the more promising.

Keywords: moral beings, animal welfare, ethical blindness, the good life

Introduction

For this paper I assume that most people would describe themselves as morally conscious beings. As people who are to some degree ethically obligated to other human beings in certain ways. Most people in the Western world would probably even extent this experience to cover sentient animals and some even other living beings such as non-sentient animals, plants or even natural phenomena as forests, creeks, landscapes and ecosystems. We disagree about how far we should extend the ethical community and to the extent of our duties, but only very few would deny that they have at least some basic ethical obligations about not causing unnecessary suffering in other sentient beings. Only few of us are, in other words, outright moral bastards.

Thus, it is my claim that most humans think of themselves as good people – or at least people who in the complicated web of situations that constitute a life, attempt to do what is right at least some of the time. We are, in our self-understanding, the quiet heroes of everyday life – making ends meet, keeping our promises and taking care of each other in innumerable small ways. We are the responsible ones – the ones that we would leave our children with and expect them to be taken well care of. In a time of crisis we are the ones that we can turn to.

'We' are 'us' here, but as you might not feel that you are part of 'us' I apologize, if you are unrightfully included in this. The 'we' I am referring to is based on my own social and cultural context and it expresses in a simplified way the attitudes that are prevalent in this context to a degree that they often are taken to be self-evident.

Only problem with all this is that it seems to be a gross misrepresentation. People like this would not, in any way, be expected to continue practices that they knew were detrimental to other humans, both now and in the future and that they knew inflicted pains on billions of animals, just to satisfy what must be considered non-vital desires. But if we pause to look at the suffering that we inflict on animals to produce meat, milk and eggs to ever cheaper prices in amounts that threaten our own physical health, causes environmental depletion and has negative impact on the climate that all living beings on the planet are dependent upon, it is hard not to wonder where the good guys went.

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Animal welfare

The welfare of animals in the intensive animal production system is heavily debated. Different notions of what animal welfare actually is fuels are lot of these debates. To some animal welfare is closely related to physiological parameters such as the level of stress hormones, disease rates and mortality. To others animal welfare is closely connected to the mental experiences of happiness and suffering in the individual animals and to others again also the ability of the animal to perform its species specific behaviour is important when evaluating the welfare (Gjerris *et al*., 2006). It often seems that the more narrow welfare perspective more to the front within the animal production system (Aarup, 2011) whereas the two other viewpoints are more to the front in the public mind (Miele, 2010).

One example of these discrepancies in the understanding of animal welfare is the debate about whether dairy cows should be put on pasture for some of the time or whether it is better to keep them indoor in a controlled environment all the time. From a narrow point of welfare view it can be argued that the animals will produce more milk and be less exposed to various diseases if kept in a controlled environment. Furthermore problems of muddy pasture trails and hoof and leg injuries can be avoided or at least minimized. From a broader perspective one can argue both that the animal will gain positive mental experiences from, e.g. being exposed to the elements, etc. although this also carries the risk of e.g. freezing. And from an even broader perspective one must say that whether or not the cow gets positive experiences from getting outside, it is part of the life of a cow to be outside at least some of the time (Det Dyreetiske Råd, 2006).

In other instances the case of animal welfare is much more clear cut. One example can be found in the intensive chicken meat production. One of the largest problems here is foot pad dermatitis also known as 'foot burns'. Foot burns typically occur when the chickens are raised on wet or damp bedding. This dampness occurs mainly because of the litter from the animals, but is also influenced by other factors such as climatic conditions, ventilation and feed. In Denmark, which is one of the few countries to actually track the size of the problem, a score system has been developed. Chicken feet with no or very small superficial lesions (slight discoloration on a limited area, mild thickening of the skin) are given the score '0', feet with mild lesions (discoloration of the foot pad, superficial lesions, dark papillae) are given the score '1' and feet with severe lesions (ulcers or scabs, signs of haemorrhages or swollen foot pads) are given the score '2' (Basset, 2009). Approximately 10% of the birds which means approximately 10 million birds per year are given the score '2' in Denmark (Hovgaard, 2011).

In other words: 10 million animals that as far as we know have the ability to feel pain and suffering are each year put through the experience of having their feet etched by their own litter to a degree where it without question is causing them pain. This happens in a country that according to a survey from FAO has the largest meat consumption per capita in the world (The Guardian 2009) and where the average citizen spend around 10% of his or her net income on food (Hansen, 2011). It is, in other words, hard to justify the pain and suffering of the animals by pointing to vital human needs that are fulfilled by the production.

Things are, obviously, more complicated than this. There are reasons not change the bedding as well. The risk of getting infections into the closed production system would grow, if the chickens where to be temporarily removed to change the bedding. The chickens might be harmed when gathered to be temporarily removed, (Ambrosen, 2010). But the bottom line is that millions of animals are put through pain and suffering to fulfill non-vital human needs. And the example of foot pad dermatitis does not stand alone in modern intensive animal production. Castration of piglets without any use of anesthesia, debeaking of poultry, fixation of gestating sows are all examples where the efficiency oriented design of

the production system cause the animals harm and suffering – only to ensure that consumers can buy meat, eggs and dairy products at low prices (see Foer, 2009).

It is not that the welfare of animals used within agriculture is not discussed in the Danish or European context. Claiming that 'I did not know' when faced with the facts of animal suffering caused by meat consumption has a false ring. It might be that one is not aware of the specific examples, but to claim to have been totally misled by the commercialized picture of intensive animal production as the idyllic Old Ron MacDonald`s Farm, seems overtly naive. It seems unlikley that one can be a moderately informed citizen and not know that modern animal prodcution entails a range of welfare problems for the animals.

J.M. Coetzee discusses the issue in his book 'The Lives of Animals' (1999). The book, originally presented as the 1997-1998 Tanner Lectures at the University of Princeton, makes a provocative comparison between the death camps of the Nazis in the 1930s and 1940s and the intensive animal production system. The analogy is debatable (and is presented as such in the book). There is, however, one spot where the comparison seems right on. And that is in the similarity between the claimed unawareness of many ordinary Germans of what was happening in the camps and the claimed unawareness of many Western consumers of what is happening in agriculture. We live, claims Coetzee, in a willed blindness towards the issue of animal suffering – and we have a well-trained ability to forget what we know, if we happen to learn what is going on.

Coetzee claims that this willed blindness can be seen as an analogy to what happened in Nazi Germany. The knowledge of what was going on in the death camps were too costly a knowledge for the ordinary German citizen. Allowing oneself to know that neighbors and friends were slaughtered as animals to free the State of claimed enemies, would put oneself in danger, as such knowledge could not be acknowledged without a reaction of protest that would surely endanger one's own life – thus the willed blindness (Coetzee, 1999).

The analogy with the intensive animal production systems seems to breaks down here. Obviously no one needs to 'forget' the welfare problems to protect their own existence. Some are economic dependent on the system, but it is a minority. To the large majority, changes in the animal production sector that would ensure a minimum of acceptable welfare for all animals, would only lead to higher prices and probably a reduced consumption of animal products, but not touch any vital needs or threaten their lives. From a dietary point of views most would benefit from a diet with less meat in it than currently the average (Compassion in World Farming Trust 2004).

So why is it that we do not wish to see the obvious? What is behind our willed blindness? Why is it that we do not behave as the moral beings that we claim to be in a situation where living beings are subjected to unimaginable suffering to satisfy our non-vital desires? Before attempting to answer that question, I will briefly look at some of the other consequences of intensive animal production that also would see us taking immediate and radical steps, if we were as moral as we usually claim that we are.

Meat and nature

Animal production does not only affect the welfare of literally billions of animals. The environment is also negatively affected by the production. According to FAO´s extensive overview report from 2006 some of the effects are: Extensive use of arable land to feed production, deforestation to provide grazing lands, overgrazing, compaction, erosion and desertification of pastures leading to degradation of arable land, depletion of scarce water resources, eutrophication, degeneration of coral reefs and general pollution of water, air and soil caused by animal waste, hormones, antibiotics, fertilizers and pesticides spent in feed production. To all this can be added an extensive contribution to anthropogenic greenhouse

gas emissions contributing to climate change and the enhanced stress on ecosystems globally and locally (Steinfeld *et al*., 2006).

The issues mentioned here are each subjects of heated discussions between scientists, stakeholders and the general public just as they all demand closer scrutiny and are subjects of scientific uncertainty. Just as with the questions of whether cows should be on pasture land or not, there is reason to discuss the specifics. But just as clear is it that both intensive animal production and more extensive animal production systems cause widespread environmental degradation on a global scale harming not only human beings but also countless species of wild animals and plants not to mention the ecosystems that support them.

As with animal welfare the knowledge of singular issues within the animal production –environment complex might be limited, but it is hard to believe that average citizens in European countries can claim to have no knowledge what so ever of these issues. We are tirelessly consuming unnecessarily huge amounts of animal proteins and the production of these degrades nature in a number of ways. This degradation again harms not only ecosystems, but also plants and animals and – directly and indirectly – other humans, both present and future.

Is this the action of moral beings? Do we accept that these are the consequences and that they are justified by the gain – an intake of animal protein that also is a contributing factor to the growing problems with obesity and related diseases (Popkin and Gordon-Larsen, 2004)? Or do we look away in willed blindness from this and continue what we are doing – discussing minor details of improvement while the ground is beginning to burn beneath our feet?

The same story can be told of other sectors of human life effecting emissions of greenhouse gasses bringing on anthropogenic climate change. The warnings have been there for decades, perhaps never more clearly than in consensus report from the scientific congress held in 2009 prior to COP15 in Copenhagen: 'The scientific evidence has now become overwhelming that human activities, especially the combustion of fossil fuels, are influencing the climate in ways that threaten the well-being and continued development of human society' (Richardson *et al*., 2009: 6).

We know here we are headed. We can debate the details and recognize uncertainty about consequences, but the overall picture is clear. Even with the knowledge that what we are doing is causing pain and suffering to billions of sentient beings and irreparable damage to the very planetary foundation of their and our own existence – by and large we continue along the same tracks (Hamilton, 2010).

A new moral vision?

The discrepancy is clear. On the one hand we claim to moral beings, on the other hand we act like nothing but our short-term non-vital interests mattered. Fossil fuels, for example, are obviously also used to satisfy vital needs – here I just refer to e.g. individualized transportation methods when other solutions are at hand and energy used to run the animal production system when a more plant based diet would be just as suitable for human needs. Within each sphere of misuse there are areas of discussions and uncertainty, both overall it cannot be claimed that the reason we act like we do is a lack of knowledge. We do know basically what the problem is and we do know that there are only two solutions. Either change our way of life or figure out how to maintain our current level of consumption without doing the damages we do. As the last option when it comes to animal pain and suffering caused by intensive production systems is dependent on science fiction scenarios of genetically modified animals made to stupid to suffer (Shriver, 2010) or stem cell grown meat (Datar and Betti, 2010), it seems we are left with the option of changing our dietary habits.

This is where willed blindness comes in to the picture. By not seeing what we know, we seek to escape changes to our life that we find detrimental to it. The role of meat and other animal products is very complex within cultural, social and individual contexts (Counihan and Esterik, 1997). The claim here is just, that eating meat to most people is an integrated part of their understanding of what a good life is. A very simple example of this is the role that meat plays at festive seasons across most cultures.

How to change this? How to make us want to see what we do not want to see out of fear that the knowledge will force us to give up traditional elements of what is considered the good life? There are basically two ways. In a book containing more than 80 articles by world famous politicians, religious leaders, authors, thinkers, artists, etc. the editors express what is needed from their point of view: 'What will move people to save their beloved worlds? Clearly, information is not enough. What is missing is the moral imperative, the conviction that assuring our own comfort at terrible cost to the future is not worthy of us as moral beings.' (Moore and Nelson, 2010: 2)

But is installing a new moral vision in humans to make them act differently what is mainly needed? We already know that we are on thin ice, morally speaking. Do we really need to change our moral vision to acknowledge that other sentient beings have moral significance? Is it so that we will stop creating the victims we do today tomorrow because we suddenly realize that they are indeed victims and – in the case of the animals we eat – not just production units. Or is it so that we already recognize this – and this is exactly why we have made ourselves willfully blind. How many humans need to change their moral vision to acknowledge that it is morally wrong to etch away the feet of a chicken just to get more and cheaper meat in a diet that is already overflowing with it? My claim would be: Very few.

Change is needed, but not so much in moral visions as in our visions of what the good life is (McIntosh, 2009). In a range of areas related to climate change this is the case, but perhaps nowhere as visible as in the case of meat consumption. As long as we do not trust that the life-style made necessary by the ecological limits of the planet and the ability to feel pain and suffer present in non-human animals – so long will we remain willfully blind to the moral significance of anything but ourselves.

Living like the moral beings we like to think we are, demands that the distance between what we ought to do in a moral sense and what we want to do is reduced. This can be done by either diminishing the moral 'ought' or by changing our visions of the good life. The first option is tempting, but can hardly be ethically justified. The other option is challenging, but as the visions of the good life that perpetrate our culture today are leading us not only to unethical, but also self-destructive behaviour, there seems to be little choice.

From a didactic standpoint the choices are either to point to our current failures and show our ethical shortcomings or to point to new opportunities of good lives. My guess would be that the latter is the easiest way to accomplish the beginning of the changes we – and the (other) animals – so desperately need. Asking humans to change their behaviour for good by pointing to that it is a necessary sacrifice of central elements og their visions of the good life on behalf of naimals and future generations is not enough to change our behaviour. We are to selfish for that. But presenting visions of the good life to humans that can convince them that they are not giving up the good life, merely broadening their understanding of just what that might be – that could perhaps bring us to remove the self-imposed blindfolds from our eyes.

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Section 1. Sustainability: general issues

Which sustainability suits you?

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Abstract

When talking about 'sustainability' in theory, people often refer to the triple P-concept, where People, Planet and Profit are three pillars of equal value. In practice, these three terms are very often used against each other to prove one's right, depending on one's worldview. If one is looking to sustainable solutions for different problems, it is very important to understand how others see the world and evaluate things. One way to analyze different worldviews is by dividing them by focusing either on their ontological status (reductionism versus holism) or on the epistemological status (subjective versus objective). Combining these two gives us four different worldviews: personal-egocentric (subjective-reductionist), cultural-social (subjective-holistic), ecological (objective-holistic) and technical (objective-reductionist). For each of those four worldviews, a 3P-ranking can be made. In a personal-egocentric worldview, Profit is the main goal because it pleases the People. Planet is often used within the limits of promoting the other P's, as becomes illustrative in the green-washing by companies. In a cultural-social worldview, People as individuals, as a group or as a species are the major concern, followed by Planet as a necessary biotope for man. Profit is used to make sure that both Planet and People are protected. In an ecological worldview, the Planet as ecosystem is the most important thing, which can only be saved by People and where Profit is the trigger to let People behave in a Planet-saving way. In a technical worldview, mostly People, Planet and Profit are considered as independent entities. This implies that different people have different desires and act different in the same circumstances in order to reach their individual 'sustainable' solution.

Keywords: triple-P-concept, worldviews, sustainability

Introduction

Since the report 'Our Common Future' of the Brundtland-Commission (WCED, 1987), the themes of sustainable development and sustainability became very prominent in all kinds of discussions – from biodiversity to responsible food consumption. Although afterwards, different definitions of sustainable development have been presented, the WCED-definition is still the best-known and the most widely used: 'Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.' (no. 27) The document further states that 'sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional changes are made consistent with future as well as present needs.' (WCED, 1987: no. 30). It clearly mentions that sustainability is never achieved. Something can always become more sustainable, which implies that the discussion about sustainability could never stop. Just like 'health' and 'happiness', constant efforts for 'more sustainability' are desirable (Van Latesteijn and Andeweg, 2011). Sustainability has become a leading principle and a societal ideal for a large variety of activities. Take for instance, sustainability assessments, where they usually support a three-pillar approach within sustainable development, a social one, an ecological one and an economic one. Assessments, using this triple-bottom-line-model focus on an integrated assessment of these perspectives. But these assessments could not solve the fundamental question at stake, i.e. 'what sustainable development should entail' (Knippenberg *et al.*, 2006: 73).

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Sustainability and the triple-P-concept

When sustainability is discussed nowadays, the triple-P-concept (People, Planet, Profit) is very often used. 'People' refers to the social costs and benefits, influencing public opinion and the values, perception and interests of citizens. The goals for sustainability 'should be about opportunities, capacities and capabilities to choose, adapt, adjust, improve, and communicate' (Knippenberg *et al.,* 2006). 'Planet' refers to the ecological costs and benefits. The ecological pillar deals with norms and goals regarding 'natural capital' and public environmental goods, asking not to trespass ecological limits (air, water, climate, biodiversity, forests, soil). 'Profit' refers to the economical costs and optimising benefits. Norms and objectives for sustainability in the economic sphere should be about improving this process of optimization.

Although these three pillars are told to be of equal value, one often gives much more attention to one of those P's to prove the right of one's view on sustainability or to counter a different opinion. When referring to 'sustainability', sometimes one only strives for an ecological balance as is the case in the article entitled 'Broad sustainability contra sustainability' by Hueting and Reijnders (2004). They come to the conclusion: 'In view of the arguments mentioned in the previous sections, the designation 'narrow' should be dropped when sustainability refers to an equilibrium relation between human activities and the environment. The indicators for sustainability which also include economic and social elements proposed so far (...) are flawed because they rather generate fog than shed light on the road to a sustainable production level' (Hueting and Reijnders 2004: 259). Since there are easily measurable and universal criteria indicating the limits of the carrying capacity of the earth as ecosystem, why should we not restrict economic activities and social systems? But as Davidson (2009: 79) proposes correctly: 'Our obligations to future generations include the obligation to leave behind not only a healthy environment but also a healthy economy and society, these also being prerequisites for a good life'. But again, the question is how we could develop a consensus on what sustainable development is since the method to derive norms or goals also differs in each pillar. Especially the social realm creates a problem. Sometimes it is solved by introducing a stakeholders approach, but could stakeholders be trusted? We are always struggling with the practical problem that we often lack the capacity to take rational decisions about the long-term implications of our acting now. So at the end a coherent view on the kind of obligations we have towards future generations may prove to be very difficult.

Discussing sustainability, we cannot avoid developing meta-criteria. One's worldview does not only influence the sorts of norms and goals used for a sustainability assessment – from an exclusive focus on scientific facts in order to foster the issue of climate change to a focus on value commitments in order to foster 'People' – but also the point of view in outweighing tensions between these three P's. Although other ways of evaluating and discussing one's behaviour with respect to sustainability are possible (e.g. Casimir and Dutilh, 2003), we propose to distinguish four different worldviews, based on ontology and epistemology and show that within each of those worldviews a certain priority among the triple-P-principles is given, explaining why debates about assessment indicators for sustainability are difficult to solve.

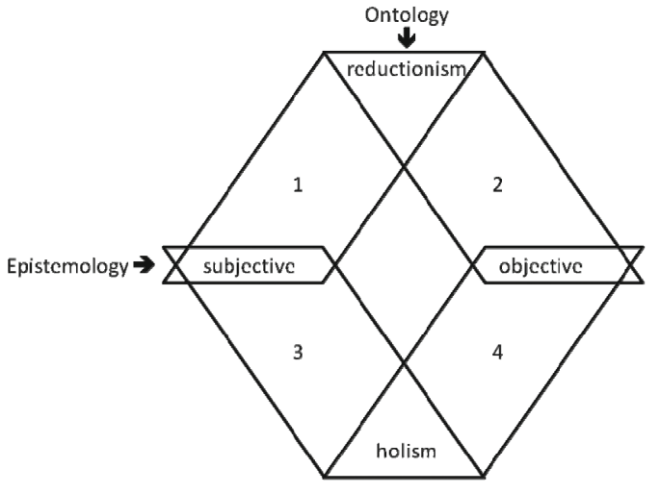
Different worldviews

In order to understand why people act and argue in a certain way when discussing sustainability, two distinct philosophical approaches can be used to distinguish different worldviews: we can look to things from an ontological viewpoint, e.g. from a particular belief about what nature is, and from an epistemological viewpoint, e.g. from the way we analyze things (Olesen *et al.*, 2000). From an ontological point of view, one can look at nature in two radically different ways. At one hand, there is the extreme reductionist view where is believed that nature can be divided into isolated parts (e.g. a mechanistic

study of individual plants or research on sugar beet production) and where the whole equals the sum of all these parts. At the other hand, there is the holistic view where all parts are connected to each other and where altering one part also affects other parts because everything is dependent from one another (e.g. organic agriculture, seeking for an equilibrium). From an epistemological point of view, our way of analyzing things can also be divided in two radically different ways: an objective viewpoint where is believed that we can analyze everything in a detached way since things have objective value. Subjective emotions and personal values do not influence value recognition and decision-making processes. Opposite to this, is a subjective viewpoint where people's evaluation is affected by and even based on personal values and emotions. A combination of these two-on-two views gives us four different types of worldview (Sriskandarajah and Bawden, 1994): a personal-egocentric worldview (subjective decision-making + reductionist and fragmented view on nature), a technical worldview (objective decision-making + reductionist and fragmented view on nature), a cultural-social worldview (subjective decision-making + holistic view on nature) and an ecological worldview (objective decision-making + holistic view on nature).

Worldviews and sustainability

In these four worldviews, the triple P (People, Planet and Profit) do not have equal value. It is obvious that for someone with a personal-egocentric worldview (i.e. subjective and reductionist) his/her own welfare (i.e. profit) is more important than interests of both other human beings and the environment. On the other hand, a personal-egocentric person needs society (i.e. people as customers) in order to make profit, so in this worldview one will try to convince society that what he/she is doing is right. Due to the increasing interest in green sustainability, green-washing is a very well-known practice of window-dressing: a particular company claims to do efforts in favour of the environment, but in fact



1. personal-egocentric worldview
2. technical worldview
3. cultural-social worldview
4. ecological worldview

Figure 1. Different worldviews based on differences in ontology and epistemology.

uses the Planet as a tool to convince People to buy their 'sustainable' products, in order to make Profit. Here, the three P's are not seen as three equally important pillars, but as building blocks where the underlying blocks are needed in order to get the ultimate goal, *in casu* Profit. We call this 'enlightened self-interest' which means that persons who act to promote the interests of others ultimately further their own self-interest.

Someone with a cultural-social worldview defends a holistic view, but is still influenced by subjectivity. One does not handle from an individual point of view, but situates oneself within a cultural tradition. This worldview could be and often is in Western countries an anthropocentric one, due to the religious past and present, where humanity is placed on top of the 3P-list, but with respect for nature. Since life is transient, the survival of the society is more important than personal gain. Profit here is not a goal, but a means to survive and to serve the 'common good'. Even the protection of the environment is taken care off in order to let humankind survive (anthropocentric environmental concerns). In practice, people who buy Fair Trade and care about the tropical rain forests for reasons of duties towards future generations are motivated by a cultural-social worldview. Often so much attention is given to human concerns (a sufficient and just income of farmers, job opportunities, etc.) that the environmental concerns are not taken as serious as the human concerns. In this worldview direct obligations are only towards humans, not to the environment. To the extent that environmental concerns fit into human interests, they will count but even if this is the case, we interpret them as indirect obligations. The three P's are seen here too as building blocks, but the ultimate goal here is saving People.

In a radical ecological worldview, humans are seen as just one of the billions of species on Earth (cf. the importance of biodiversity), making People only a small subset of the Planet. In order to protect the

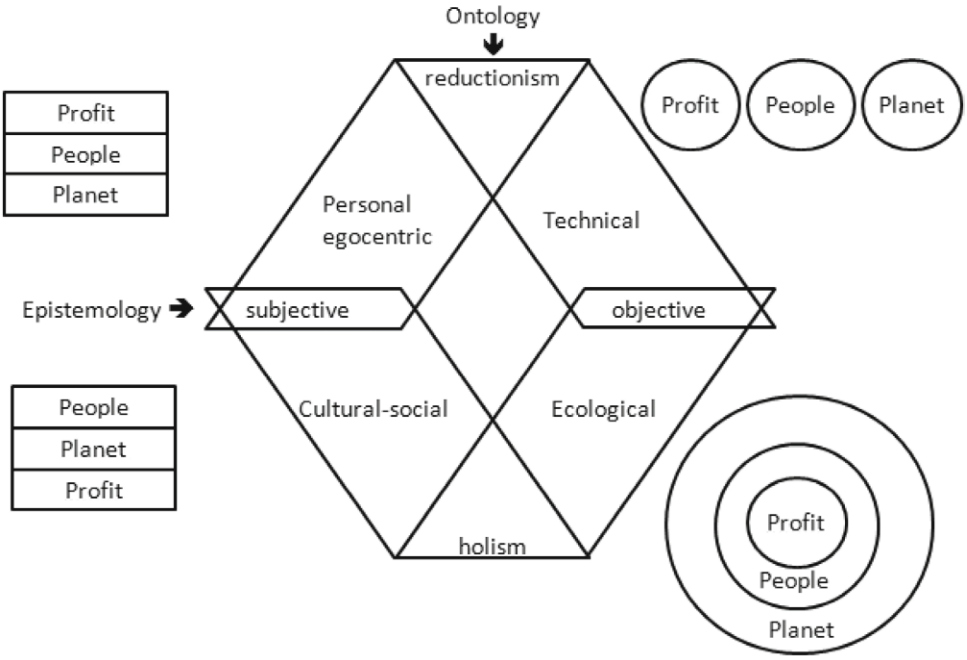


Figure 2. Different worldviews result in a different triple-P-ranking.

planet and all living beings dwelling upon it, humans need to be convinced that our habitat (and that of billions of other species) is vulnerable and that humanity has a severe and too big impact on several ecological parameters. Important topics for people with an ecological worldview are climate change, biodiversity, air and water pollution... For people living in a market-economical environment, positive financial incentives are needed to lure people to do the right thing for the Earth, but for those who adopt an ecological worldview Profit is seen only as a subset of society. Negative incentives and even coercion is discussable.

Since a technical worldview can be described as 'objective' and 'reductionist', it is characterized by the fact that one is mainly focused on the themes people and profit. This kind of worldview can often be found in the scientific world because scientists due to their methodology often have a fragmented view on nature.

Triple-P and principles of sustainability

Is it possible to describe an all-encompassing perspective which avoids undesirable trade-offs between the three perspectives? Could we balance the different interests and claims and work out a fair treatment of all wants, needs and deeds? Knippenberg *et al.* (2006) believe that we need some kind of overall principles. In the literature on sustainable development one mostly mentions the principles of justice (fairness) for People, resilience for Planet and efficiency for Profit:

> It is not difficult to understand this choice. Sustainable development is about fair deliberation, about fair access to opportunities and about the fair distribution of profits and liabilities. This makes justice, defined as fair distribution, a core principle of sustainable development, irrespective of the particular circumstances or particular preferences. (Knippenberg *et al.,* 2006: 77).

Resilience is the capability of ecosystems to provide ecosystem functions in a normal manner and to cope with stress. Resilience means that a system in process is capable of self-organisation. It also indicates an adapting capacity to resist a severe decline in functioning due to changing circumstances. Efficiency deals with the allocation of limited resources and the fact that we are supposed to make trade-offs between competing goals, while choosing at the same time the suitable means to an end. How to present these three principles in such a way that they could give guidance to public debates about the three pillars of sustainable development? According to Knippenberg *et al*. the three principles refer to systemic properties because they characterise a particular quality of the interactions within a particular system: 'Justice is about fairness in a societal system. Resilience is about adaptation and regeneration of a system or systems, and efficiency is about the working of a system'. (Knippenberg *et al*., 2006: 78). For solving concrete discussions about sustainable practices, they propose a combined approach of these three principles, including the use of certain minimum norms per pillar, and a stakeholder approach. Stakeholders are requested to frame their perspectives by making use of the three principles and searching together to norms and goals in a particular context.

Conclusion

Which sustainability suits you? We focused in this paper on the question if it is possible to develop a consensus on what sustainable development is since the method to derive norms or goals differs in the three pillars (economic, ecological, social). First of all, we are convinced that it is necessary to consider meta-criteria in order to debate on sustainability. Worldviews do not only provide the kinds of norms and goals used for sustainability assessments but offer also a basis for outweighing tensions between the three P's (People, Planet, Profit). Although other options for classifying worldviews are possible, in this paper we focused on four different worldviews, divided by an ontology-based and epistemology-based approach. For each of them, we have indicated that within each of these worldviews a certain priority among the triple-P-principles is given, explaining why discussions about assessment indicators

for sustainability are difficult to solve. Especially the social pillar creates a huge problem. People might act in an ambiguous way and context- and interest-dependent. Sometimes this problem is solved by introducing a process-based approach, with a firm stakeholders' participation, but could stakeholders be trusted? How can be avoided that stakeholders react in an emotional and subjective way and lack the capacity to take rational decisions about the long-term consequences of their acts? So at the end, developing a coherent view on the kind of obligations we have towards future generations by using traditional assessment tools may prove to be very difficult. Those traditional assessment tools are often not sufficiently comprehensive to be labelled as true sustainability assessments. In order to solve this severe problem, we have introduced the idea of Knippenberg *et al*. that sustainable development necessitates a triple principle-based framework (justice, resilience, efficiency) in order to help stakeholders with fine-tuning their discourses and behaviour – very much influenced by their respective worldviews – in confrontation with existing norms and goals within each of the pillars of sustainable development. We believe that this kind of approach not only reduces complexity but also strengthens commitment, deliberation and creativity.

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The value(s) of sustainability within a pragmatically justified theory of values: considerations in the context of climate change

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Abstract

Forced by, among others, climate change land-use practices and food production are in the stage of ongoing transformation. For instance, the development of agricultural production systems reducing greenhouse gases now is regarded as a reaction to climate change and its consequences. As different adaptation options arise, sustainability is considered as a normative key concept giving orientation for decisions in the mentioned contexts. Apart from well-known terminological and theoretical problems, in practical perspectives the concept of sustainability underwent a great success story. We endorse the approach to understand sustainability as a deontological ethical approach ultimately based on intra- and intergenerational justice. At the same time, one can speak about sustainability as a general moral value or value set guiding individual and collective decision-making. The situation is getting complicated when several other values are accepted in the relevant contexts at the same time (e.g. progress, social justice, nutrition). For the solution of arising value conflicts, an approach to values is required which allows weighing and trading off competing values. In the first step, a pragmatically justified theory of values is introduced that takes contemporary value pluralism seriously. Although values cannot be regarded as independent of time and space, historically contingent values are employed as valid and binding by agents. Out of consensual compliance patterns follows the possibility to contrast and relate values within a value system. In the second step, an 'acid test' of the value theory is made: It is practised in the context of climate change where sustainability is immersed in competing values and value sets. In that way, the suggested theory is pragmatically justified by successful application options.

Keywords: ethics, participation, pragmatism, sustainable development, value theory

Climate change and sustainability

In environmental discourses, it is widely accepted that dimension and pace of current climate change mainly, but not only result from global technological use of hydrocarbon fossils as energy supplies. According to a common development perspective and at least until very recently, significant increase in energy consumption was correlated with the economic growth rate in industrialised countries, where human population growth rates are relatively low or even negative. At the same time, developing countries used to have less energy use, but high population growth rates. The latter population dynamics together with drastic social and economic change have been and still are leading to disastrous malnutrition. On top of that, many countries are facing irreversible degradation of the life supporting functions of the global biosphere, which can have disastrous consequences for future generations. In that situation, a total decrease of economic growth at least in developed countries is often discussed as a strategy to reduce anthropogenic climate change (Carpenter, 1998; Paech, 2011). But this is often being rejected as a possible global solution because of the expected negative economic and social outcomes, not least to nutrition. We will not judge on the debate on de-growth, post-growth, or qualitative growth here; nevertheless, fundamental changes in production and consumption patterns in developed countries are indisputable. Especially since 'Limits to Growth' (Meadows *et al*., 1972) sustainability (or sustainable development) is considered as a normative key concept giving orientation for coordinated decision procedures from the global to the local scale. For instance, the transformation of agricultural production

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systems (e.g. growing plants for energy supply) reducing greenhouse gases can be regarded as both a mitigation and adaptation reaction to climate change and its consequences in the sense of sustainability. But is it sustainable?

There are well-known terminological and theoretical problems, which are constantly emphasised whenever the term sustainability is employed making strong ethical and political claims. The central issue behind the concept of sustainability is the availability of scarce resources for the needs of present and future generations. The influential United Nations' 'Brundtland Report' (WCED, 1987) demands that sustainable use of resources should meet 'the needs of the present generation without comprising the ability of future generations to meet their own needs'. Although the mentioned definition allows for application on various fields, the sustainability concept is mainly discussed with regard to the interrelationship of human populations, economic enterprises and ecological systems (Carpenter, 1998). In political debates, it is often stressed that social, economical and ecological dimensions are coequal 'pillars' of sustainability, which have to be considered at the same time (von Hauff and Kleine, 2009).

However, if one accepts the (disputed) three-pillar model, it is still an open question what it precisely means to act in a 'sustainable way'. The model is criticised to be open for various strategic exploitation. Speaking about sustainable development, many politicians or economists in fact mean steps for political or economical goals exclusively. For instance, if sustainability is reduced to the aspect of economic progress, it would be nothing more than 'sustained economic growth'. Compared to the economic pillars, ecological and social aspects of sustainability regarding human interaction with the natural environment are frequently treated as low-ranking. Thus, several sustainability theorists argue that the primary normative goal should be the establishment of real coequality between the mentioned three pillars of sustainability (Ott, 2009; Winter, 2007).

Apart from those problems, the concept of sustainability underwent a great success story in *practical* perspectives: Since its first international usage in the context of global environmental issues in the 1980s, the idea has been adopted by many agents especially involved in development and resource policy. Moreover, most international treaties and policy programs referring to the term witness its important role (e.g. UN Conference on Environment and Development, Rio de Janeiro, 1992). Although theoretical problems lead some to the resigning assumption that sustainability is difficult to grasp, its practical impact is indisputable. As the normative idea of sustainability is widely accepted, not least on a global scale, sustainability can also be regarded as a moral value. This value approach complements ethical approaches conceptualising sustainability as being derived deontologically from the high-ranking principle of intra- and intergenerational justice (Ott and Döring, 2008). On motivational and political debate levels, norm-providing ethics at times is conceived of as a permanent trouble-maker restricting and limiting the range of possible actions. With regard to this peculiar – and largely false – understanding of ethics, the reference to values seems more promising: Values do not limit a range of action but make action possible in the first place; values *are not restrictive, but attractive (*Joas, 2005).

On the basis of these pragmatic considerations and complementary (not in opposition) to deontological approaches, we suggest sustainability as a moral value or value set. In the first step, we clarify our theoretical framework of values. Compared to other value-based concepts of sustainability (Attfield, 1998), we refer to a pragmatism-orientated value approach mainly based on the work of Hans Joas (2001). If sustainability should provide orientation for local, regional and global policies alike, e.g. with regard to reducing anthropogenic climate change, the situation is getting complicated when other values (or understanding of the same value) are accepted in the relevant contexts at the same time (e.g. environmental integrity, social justice, nutrition). For the solution of arising value conflicts, in the second step we suggest a possibility for trading off the values of sustainability among each other and with competing values.

Sustainability as a moral value (set)

We regard values as reference points for evaluations; values are emotionally and rationally binding, giving long-term orientation and motivation for our action. Accordingly, values work as ideals or criteria (i.e. reference points) for evaluating actions, persons, institutions, things, attitudes, norms, etc. as good or bad (Mandry, 2009). They encompass an active and passive respectively rational and emotional element: Following 20th century philosophy, values have to be acknowledged *actively* by valuing individuals and collectives (cf. Bohlken, 2006; Schnädelbach, 1983). In an active sense, values are 'conscious or unconscious orientating standards [...] that lead individuals or collectives action decisions' (Horn, 2002). Only truthful, internalised and action-leading evaluations are regarded as 'values'. Values are strong intrinsic motivators that make actions possible (Joas, 2001). Acting in accordance with values, actors behave in consonance with their own self-conception, in a way they want to see themselves. In a *passive* manner, individuals and social groups feel bound to their values; they do not simply change values because of calculation, preachments or objections. Values are comparatively stable, without being unchangeable over time (Joas, 2008). The inevitable *emotional* component can be seen when a value is challenged by non-complying action. If we witness the violation of a value, we do not simply state it soberly, but we have strong moral feelings such as outrage or shame (Joas, 2005). At the same time, by affirming something as a value, we are inclined to think that others should value it too without directly prescribing this. According to the *rational* component, reference to values allows for ethical consideration such as argumentation, reflectivity and eventually justification. A value expressing subject can give reasons for being bound to this certain value. We disagree here with Siep (2004), who holds that values are accepted 'on their own' as non-justifiable normative standards instead of being necessarily justified by reasons. In contrast, we argue that values can be justified: We might have good reasons for their acceptance – not in the sense of 'ultimate justification' ('Letztbegründung') but in the sense of explicitly reason giving and reason taking in a rational discourse. If the end of justification is to convince an addressee by arguments, the justification process has to be adjusted to situational requirements and to the accepted kinds of reasons (Ott, 2005).

In this vein, we aim at a pragmatically justified theory of values. By using the paraphrase 'pragmatically justified', we are aware that pragmatism is an opaque concept. In general, at least two meanings of pragmatism can be distinguished (Schurz, 1998): For many people pragmatism characterises knowledge and its rationality in terms of its relation to the subjective purposes of the user (practicability); others ascribe knowledge as pragmatically justified in terms of its general functioning for anyone in its context. We use the term in the latter meaning, which is traced back to the philosophical school of American pragmatism. Pragmatists regard beliefs, concepts, guiding rules, etc. as habits or dispositions of action, in order to solve contextual problems (Anderson, 2010). In this sense, action guiding values are instruments to resolve our practical problems. Doubt arises when certain habits are challenged by new problems, when normal course of activity on them is not possible or yields unsatisfactory consequences. Then, the contents of beliefs and guiding rules should be clarified by inquiry and approved by their 'practical consequences' as the criterion for validity. Further pragmatic developments brought that beliefs, concepts and hypothesis are not only challenged by practical use (J. Dewey); their validity is mainly dependent from intersubjective, 'symbolic interactions' (G.H. Mead). Connected to our emotional and rational situation, we make single experiences, in which we appreciate objects, properties, states of affairs, facts, etc. evidently and effectively as 'good'. If repeated individual value experiences are articulated to and accepted by others, these experience-based evaluations (or 'valuings') might become socially intermediated 'values' in a proper sense. Thus, values can be regarded as results from evaluation processes eventually constituting reference points in a dialectical process.

From contemporary pragmatic value theories, Hans Joas' idea of the genesis of values is a promising approach (Joas, 2001). According to Joas, value bindings originate in 'experiences of self-formation

and self-transcendence': Referring to the fundamental assumptions of Mead, individuals are conceived as beings forming their Self through dialogical experiences with the Other as parts of a larger discourse community. As the process of the *self-formation* is based on interactions in childhood and adolescence, individuals get used to value bindings through dialogical experiences with their social surrounding (e.g. family, groups). This constitutes a value system that is not fixed, but open to change. Change can occur in experiences of *self-transcendence* which allows individuals to cross their borders and to make new experiences that lead to new value commitments. Possible experiences of self-transcendence are collective ecstasy, prayers, especially intensive experiences of agony, fear or violence.

A pragmatically justified theory of values has several advantages: First, it takes into account that actors already have concrete and strong beliefs about 'values' they feel bound to. The pragmatic value concept is applicable by persons with different moral background in different contexts. Secondly, it takes the situation of several and heterogeneous accepted values within a value community seriously (i.e. freedom, wealth, etc. besides sustainability). Descriptions of a pluralistic society with a plurality of values are empirically undeniable and broadly accepted. Thirdly, it offers a value theory neither claiming the eternal existence of fixed values independent of time and space nor paving the way for value relativist or value subjectivist positions. Instead, historically contingent values can be employed as valid and binding – not for eternity but for a certain given time or at least for certain societies. Even if in pluralistic backgrounds, the acceptance of certain justification models is difficult, one must not underestimate the consensual acceptance of basic values, which gain a quasi-objective status. But, as values are generated in dynamical interactions between individuals and society, the question arises if it is possible to reconstruct a substantial axiology of a social group. This would be necessary if we want to solve the problem of competing values in a certain context.

Value conflicts within a pragmatically justified theory of values

Any value theory necessarily is challenged by value conflicts. Which value should be preferred or brought forward in action decisions if several values are at stake? As the value systems of individuals are based on subjective, cognitive, social and contextual factors, the generation of an objectively or at least intersubjectively binding value system is the main challenge (Horn, 2002). We distinguish two phenomena of value conflict:

(a) *Intra-value-conflict* basically describes different understandings of the same value. As we have already seen, sustainability for (neoclassic) economists seems to be something different compared to conceptions of environmental activists. Linguistic ambiguities can also arise, if sustainability is regarded as an umbrella concept (value set) referring to different values (Mason, 2011). The following values might be identified with sustainability (Carpenter, 1998; Engel, 1990; Kothari, 1990): (a) Emphasis on sustaining natural resources implies the value of environmental quality (e.g. biodiversity, ecological integrity); (b) the aspect of development leads to the values of economic growth and progress; (c) stressing intra- and intergenerational requirements that human populations are facing in regard to scarce resources, implies the value of social justice and equity. It becomes apparent that an overemphasis of one of the mentioned values might abandon the multi-sided features of sustainability – exactly this is the point where the three-pillar approach of sustainability fails (see above). But there are more serious issues: For instance, the relation between intra- and intergenerational justice is highly discussed. Conserving energy resources in order to account for intergenerational justice may clash with respecting intragenerational justice, as the former entails allocation problems for less-developed countries: '[A]n inconsistency is involved where theorists focus either on current needs or on future needs exclusively' (Attfield, 1999).

(b) *Inter-value-conflict* describes the conflict between two or more values in the situation of moral choice. It might easily be the case that different values are accepted in the relevant contexts at the same time. If

we regard the moral question of changes in food production and consumption patterns in developed countries, the values of adaptation/mitigation (within *sustainability*) obviously could compete with other environmental (e.g. human enjoyment, respect for biodiversity) and non-environmental (e.g. human needs, freedom, nutrition, health) values, which eventually may enforce or disturb the practical impact of sustainability. For instance, the environmental demands of sustainability seem to involve (justified and justifiable) limitation on individual freedoms and development of human potentials in the developed countries. Tensions with other values can be traced back to the weight on short-term or long-term implications and consequences of sustainability (Goulet, 1990).

For arising inner- and inter-value conflicts, a rational solution is required which allows identifying and trading off competing values. Several tasks are relevant: (1) The first task would be the identification of accepted values in the relevant context. It might be possible that different groups of people hold the same value but fill it with different meanings. It seems therefore reasonable not to deal with value conflicts in abstract but look at it in context. Thus, we have to open the black box of values and look at their content in order to clarify their meaning. In this early stage a rational dialogue about value contents might already be helpful. If sustainability, for instance, is interpreted as a value set, some participants might emphasis subordinated ecological values, whereas others stress economical values. Hence, with regard to the criticised three-pillar model of sustainability, a dialogue might help prioritizing conflicting aims (Here, reference to the basic moral principle of intra- and intergenerational justice appears as the preferred option). (2) As in certain contexts relevant values might clash the identification of value conflicts would be the second step. (3) Their solution must be provided in continuation to the pragmatic value approach. Therefore a rational discourse about the trade-off between conflicting values should be launched aiming a huge consensus within the participants of the value discourse. Out of consensual (or fair compromise) compliance patterns follows the possibility to contrast and relate values within a value system. For instance, Pildes and Anderson (1990) point out that 'individuals need to participate actively in democratic institutions to enable them to achieve a rational ordering of their preferences for collective choices'. Certain aspects of a non-violent discourse have to be considered in negotiation processes (Habermas, 1999). Although results of value identifications and trade-offs may differ between dialogue groups, the participation of value acceptors guarantees the realization of value-based decisions. In that way, the suggested theory is pragmatically justified by successful application options.

With regard to sustainability, we get back to the point that not all adaptation and mitigation approaches as such are sustainable. They have to be contextualised in a complex set of values, which are associated with sustainability and which neither can be reduced to mere 'development as growth' ideas. Combining deontological justice approaches with a pragmatic theory of values might contribute to a richer notion of sustainability and sustainable development by including the people communicating their value-perspectives more explicitly in ethical and political deliberations.

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Towards an ecological space paradigm: fair and sustainable distribution of environmental resources

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Abstract

Humanity's current consumption patterns threaten the lives of current as well as future people. This provides a strong moral imperative to take the material constraints of the environment as the point of departure for an account of sustainable distributive justice. This ecological space paradigm should focus on a multidimensional, non-aggregative conception of carrying capacity. However, because resources are merely instrumental in pursuing various ends, we suggest combining capabilities and ecological space as the currency of distributive justice. As regards scope, this integrative account has the major advantage of combining the strength of the capabilities approach regarding global justice with the focus of the ecological space paradigm on intertemporal justice. The pattern of distribution should then take the form of distributing material resources so as to enable everyone to reach the capability threshold, while the leftover ecological space should be distributed on an equal per capita basis.

Keywords: global distributive justice, intertemporal distributive justice, sustainable development, capabilities, ecological space

Introduction

The Global Humanitarian Forum (2009: 9) reports that 'several hundred million people are seriously affected by climate change today, with several hundred thousand annual deaths'. Yet future people will suffer most from its harmful effects (Broome, 2008: 97). Human induced climate change as well as deforestation and resource depletion put food and water security and health at risk (McMichael *et al.,* 2008: 191). The unsustainable consumption of natural resources thus threatens the rights and lives of current as well as future people.

Hence, the issue of sustainable human development poses a real challenge to distributive justice: how can we enhance people's quality of life today without impairing future people's opportunities to have a comparable quality of life? A conception of sustainable living in the long term is necessary, which provides a strong moral imperative to take the biophysical constraints of the ecosphere as the point of departure for an account of distributive justice.

Several theories regarding sustainability focus on these biophysical constraints, for example attempts at developing sustainability indicators – such as the *Ecological Footprint* (henceforth, EF) and the *Safe Operating Space for Humanity* (SOSH) – and the discourse on the distribution of greenhouse gas (GHG) emissions permits. Our aim is to integrate these into a general theoretical framework – the *ecological space paradigm* (ESP) – in order to clarify how they can contribute to the development of an account of distributive justice.

This paper will focus on the three main issues the ESP needs to address in order to constitute an account of distributive justice: *what* is distributed (*currency*); *who* are the legitimate recipients (and providers) of (re)distribution (*scope*)?; and according to *which principle* should ecological space be distributed (*pattern*)?

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Currency

The idea of ecological space has become increasingly popular in recent years 'because it captures how all human interactions with the natural world – our use of resources and our environmental impacts – occur within a single biophysical reality' (Hayward, 2006: 359). Central to this idea is the concept of *carrying capacity*, that is, the maximum population size of a given species that a defined habitat can support without permanently damaging the ecosystem upon which it is dependent (Rees and Wackernagel, 1994: 369). Since this Malthusian definition cannot accommodate for trade, culturally variable technology and consumption patterns, Rees and Wackernagel redefine *human carrying capacity* as 'the maximum rate of resource consumption and waste discharge that can be sustained indefinitely without progressively impairing the functional integrity and productivity of relevant ecosystems *wherever the latter may be*' (1994: 369-70, emphasis in original). In this way, ecological space can be interpreted as the amount of carrying capacity appropriated by a given population subset (Wackernagel and Rees, 1996: 11).

Although the ESP can be concretized in relatively simple accounting tools, this raises some methodological issues as well. First, in the discourse on the distribution of GHG emissions permits, carrying capacity is translated into the capacity of the atmosphere to absorb a finite quantity of GHG emissions before they accumulate and destabilize the vital climatic services provided by the atmosphere (Vanderheiden, 2008: 104). However, in addition to problems with defining this maximum allowable quantity, a persuasive objection against this focus is that it treats the ability to emit GHGs in isolation from people's access to other energy sources and other environmental resources (Caney, 2009: 130-131). Although the absorptive capacity of the atmosphere should have a central place in view of the causal role of GHGs in climate change, we need a more inclusive approach that accounts for a variety of environmental assets.

Second, the EF claims to offer such an account. It represents 'the aggregate area of land and water in various ecological categories that is claimed by participants in that economy to produce all the resources they consume, and to absorb all their wastes they generate on a continuous basis, using prevailing technology' (Wackernagel and Rees, 1997: 7). This aggregation in a one-dimensional indicator obviously has some pragmatic merits in understanding biophysical constraints and communication. Moreover, Chambers *et al.* (2000: 107) claim that aggregating different environmental impacts into one indicator facilitates exploring the connection between various ecological functions.

Nonetheless, ecological functions are also distinct, and aggregating them raises problems. Summing up all consumption related ecological impacts requires the EF to translate these into land area, but this conversion is problematic (Van den Bergh and Verbruggen, 1999: 63). In addition, it presupposes the mutual fungibility of environmental assets. However, although for example wind or solar power can substitute for fossil fuel, not all environmental assets are fungible: it is hard to see how an increased number of trees can substitute for a declining fish stock. Therefore, a multidimensional approach to ecological space is needed: 'a logical and complete system of multiple, complementary indicators, based on a systems perspective of interconnected environmental problems' (Van den Bergh and Verbruggen, 1999: 64).

Third, the SOSH framework seems promising since it does define ecological space in a multidimensional, non-aggregative way. It identifies and quantifies the planetary boundaries with threshold levels on a set of parameters associated with ten of the planet's most crucial biophysical subsystems and processes, including climate change (atmospheric carbon dioxide concentration and change in radiative forcing), rate of biodiversity loss and freshwater use (Rockström *et al.,* 2009: 472-73). Yet this framework involves some methodological problems too, most of which are related to the determination of the threshold levels. For example Allen *et al.* (2009: 56) argue that cumulative emissions levels are a far more

robust indicator of the probability of temperatures exceeding 2 °C above pre-industrial values than the atmospheric concentration levels of GHGs on which the SOSH focuses.

The methodological issues in determining the biophysical constraints of our ecosphere are thus profound. However, this scientific uncertainty should not lead to inaction as regards tackling climate change and rapid resource depletion. For all three of the mentioned approaches clearly show that humanity's current consumption patterns are unsustainable. Moreover, even when scientific uncertainty persists, the precautionary principle applies.

In addition to methodological problems, distributive justice in terms of ecological space also raises a major ethical issue. Sen (1979: 216) has argued that there is an element of 'fetishism' in resourcist accounts, for they focus on means rather than ends. Indeed, GHG emissions – and by extension, ecological space – only have instrumental value in pursuing various goals (Hayward, 2007: 436-37; Caney, 2009: 130). Resourcist approaches do not take account of the interpersonal variations that govern the conversion of resources into the person's ability to promote her ends (Sen, 1999: 74). An egalitarian distribution of resources can lead to serious inequalities in actual freedoms enjoyed by different persons (Sen, 1990: 115). Hence, according to Sen (1999: 74), we should focus on 'the substantive freedoms – the capabilities – to choose a life one has reason to value', rather than on the means to freedom.

Does this not imply that we should prefer capabilities over ecological space as the currency of distributive justice? As we will argue below, the capabilities approach cannot take into account the constraints posed by the environment. Hence, in order to develop a fair account of human flourishing *within* the biophysical constraints of the ecosphere, we suggest *integrating* the capabilities approach and the ESP. The currency of distributive justice should be a hybrid of capabilities and ecological space, which focuses on protecting and expanding people's substantive freedoms – especially those of the currently deprived – while respecting the biophysical constraints of the environment. This account will be elaborated in the following sections, which focuses on the scope and pattern of distributive justice.

Scope

While other currencies of distributive justice apply to relations of spatial distribution, 'ecological space turns this methodological approach on its head by embracing an explicit commitment to intergenerational justice at the outset' (Page, 2007: 461). The ESP shows that humanity's current demands are exceeding the carrying capacity of the ecosphere, which will adversely affect the quality of life of future people. Through this focus on the unjust impacts of human activity on environmental integrity in view of the biophysical constraints, the ESP is consistent with the preservation of the earth's ability to sustain life, which is the central requirement of intertemporal justice. However, the question remains whether the ESP can provide a convincing account of spatial distributive justice, because, as noted above, it focuses on means rather than ends. Indeed, the goal of distributive justice should be to protect and expand people's capabilities to achieve the functionings combinations they value (Sen, 1999: 75; 2009: 253).

Although we consider the capabilities approach to be an adequate, comprehensive approach to spatial distributive justice, its intertemporal application remains a matter of further deliberation. Anand and Sen have argued that sustainability reflects the universality of life claims: 'the recognition of a shared claim of all to the basic capability to lead worthwhile lives'. They focus on enhancing human capital – the productive capacity of the poor – as a major contribution to the goal of sustainability. Indeed, protecting and promoting current people's capabilities is the key goal of human development, and therefore a valuable contribution to *sustainable* human development as well. Nonetheless, their account merely begs the question, for improving people's capabilities usually takes its toll on the environment. This brings us to the real challenge: 'to make sustainability happen, we need to balance the basic conflict between the

two competing goals of ensuring a quality of life and living within the limits of nature' (Chambers *et al.,* 2000: 3). The universality of life claims requires the protection and expansion of people's capabilities today, while at the same time acknowledging the material constraints of the environment, in order to protect the capabilities of future people. In this way, the integration of the capabilities approach and the ESP can truly address the issue of sustainable human development: while the input of the capabilities approach encourages protecting and expanding people's capabilities, the ESP urges people to not exceed their fair share of ecological space.

Apart from current and future people, another subject of justice can be identified. According to various commentators, non-human species also have intrinsic value, which involves an issue of justice *towards* the environment. Until now we treated environmental capital as being merely instrumental to human flourishing. Wackernagel and Rees (1997: 4-5) and Chambers *et al.* (2000: 65) admit that the EF reflects prevailing anthropocentric and resourcist values. They emphasize the need to maintain the integrity of relevant ecosystems, functional for human survival, but this also implies the direct protection of whole ecosystems and species.

Rockström *et al.* (2009: 473-474) include biodiversity loss as a dimension of the SOSH, because it can have pervasive effects on ecosystem resilience – for example, the increase in vulnerability of terrestrial and aquatic ecosystems to changes in climate and ocean acidity. This justification is anthropocentric: it treats biodiversity as merely instrumental for human flourishing. Nonetheless, the inclusion of this dimension – together with the overall goal of confining human actions within the planetary boundaries – places humanity back within its natural environment.

According to Nussbaum (2006: 327), the capabilities approach is capable of recognizing animal dignity and yielding norms of interspecies justice 'involving fundamental entitlements for creatures of different types'. Although she focuses on sentience, her efforts to show that nonhumans are also entitled to capabilities to live a life characteristic of their kind represent a big step towards recognizing human responsibility for other species.

In sum, there are some indications that the integrative account we propose can cover justice towards the environment, but this is probably the most difficult issue any account of distributive justice has to deal with, and more analysis is needed in this regard.

Pattern

In the context of distributing GHG emissions permits, Shue (1993: 56-99) differentiates between *subsistence emissions* and *luxury emissions*. His account has been developed further by Vanderheiden (2008: 243), whose *modified equal shares model* starts from the claim that 'all persons are entitled as a matter of basic rights to survival emissions, or a level of emissions sufficient to allow for their basic human functioning'. These *survival* (or *subsistence*) *emissions* should be distributed so as to meet everyone's basic rights, while *luxury emissions* should be distributed on an equal per capita basis.

However, Hayward (2007: 432-33) argues that we should deny that there is any human right to emit GHGs, or to pollute; 'quite the reverse, there is a human right to live in an environment free of harmful pollution'. Although currently necessary, GHG emissions are not *inherently* necessary to secure subsistence. Moreover, people are entitled 'not only to mere life, but to a life compatible with human dignity' (Nussbaum, 2006: 292). *Subsistence* should thus be reformulated as a *threshold level of each capability*, 'beneath which it is held that truly human functioning is not available to citizens; the social goal should be understood in terms of getting citizens above this capability threshold' (Nussbaum, 2006: 71).

Nonetheless, ensuring this capability threshold presupposes the redistribution of some material conditions (in addition to social conditions). Ecological space should thus be distributed according to the principle of adequacy: a certain amount of ecological space is sufficient to ensure the threshold. Furthermore, intertemporal justice requires us to *live* within the environmental constraints, which in turn requires us to limit our functionings related to material conditions. After ensuring the threshold, leftover ecological space could be distributed on an equal per capita basis.

Gardiner (2004: 585-586) criticizes Shue's differentiation between subsistence and luxury emissions, and his objections are also applicable to our proposal. He argues that subsistence (or, in our account, the capability threshold) will be determined so that ensuring them will exhaust the maximum permissible ecological space budget or even overshoot it (Gardiner, 2004: 586). This means that the capability threshold would coincide with the limitation to functionings – or worse: the amount of ecological space deemed morally essential to secure the threshold will exceed the scientific optimum.

These concerns are serious and much depends on how societies define and secure the capability threshold. Gardiner rightly objects that appealing to a notion of social necessity that is independent of, and not open to, moral assessment is procedurally odd in the light of intertemporal justice. We agree that part of the challenge of climate change relates to the questions it raises about how we should live and what kinds of societies we ought to have. However, these issues require further research and do not fall within the scope of this paper.

Conclusion

We have argued that the ESP takes the biophysical constraints – the carrying capacity – of the ecosphere as its point of departure and aims to concretize it in a multidimensional, non-aggregative way. Although the methodological issues in determining the material constraints of the environment persist, all the concretizations of the ESP – such as the EF, the SOSH and the discourse on the distribution of GHG emissions permits – indicate that current consumption patterns are unsustainable. Nonetheless, because material resources only have instrumental value in pursuing various ends, we suggest combining capabilities and ecological space as the currency of distributive justice.

This integration has a major advantage as regards scope since the ESP focuses on *intertemporal* justice, whereas we consider the capabilities approach to be an adequate account of *global* distribution. The integrated approach is able to cover *both* dimensions. There are some indications that this hybrid account can also cover justice towards the environment, but this issue has yet to be addressed in more detail.

As regards the pattern of distribution, we have argued that adequate material resources should be distributed to enable every person to reach the threshold for each capability. Left over ecological space should then be distributed on an equal per capita basis. The problems with this account are related to defining the threshold. This procedure should be open to moral assessment in view of the environmental constraints, which urges us to rethink our way of living and what kinds of societies we ought to have.

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Section 2. Property rights and commons

Addressing the commons: normative approaches to common pool resources

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Abstract

Some of the critical natural resources, i.e. lakes, the seas, clean air and the atmosphere, exemplify structures of common pool resources. They are rival but non-excludable, at least highly non-excludable. Therefore, common pool resources are particularly vulnerable. In order to protect them, it has been argued that entrance barriers need to be modelled against the background of two criteria: (1) Overuse and forms of harmful use need to be prevented; and (2) access conditions need to correspond to justified claims of participation in common pool resources. Both criteria respond to normative claims. The first condition can be spelled out in terms of sustainability. The second claim has been discussed in theories on ecological justice. The particular theoretical challenge that I wish to address in this paper results from an apparent tension between both criteria. In this contribution I shall *first* introduce the concept of a common pool resource and discuss its meaning in environmental ethics. As a *second* step, I shall discuss aspects of the theory of the commons of Elinor Ostrom. Her approach includes a differentiation of the category of property which helps to address both normative criteria simultaneously. Most importantly, her discussion includes debate over a normative perspective on the commons which needs to be made explicit. As a *third* step, I shall go back to the concept of environmental rights and group rights and ask whether or not these categories are helpful in discussing legitimate access to common pool resources. My overall aim is *not* to present a normative approach to common pool resources, but rather to introduce and test whether or not the categories of property and of rights are useful in addressing the theoretical challenge of the two conflicting criteria mentioned above.

Keywords: common pool resources, group rights, public goods, environmental rights

Common pool resources

Common pool resources are a subclass of public goods. Public goods are characterized by non-excludability and non-rivalry among potential beneficiaries (Kallhoff, 2011). Different from private goods, public goods do not have mechanisms which help to exclude unwanted profiteers. Instead, they are open to all and therefore also prone to the 'tragedies' which Garrett Hardin famously attributed to them (Hardin, 1968). Since goods which have both characteristics are rare, most authors refer to the so-called 'impure public goods' (Kaul *et al*., 1999), which possess only one of the characteristics mentioned or which have both of them to some degree. Common pool resources belong to the first class. They are non-excludable, but – to some degree – rival in consumption.

According to Hardin's view, common land, fishing grounds, and even welfare goods are self-destructive systems. A pasture without entrance barriers will invite herdsmen to over-exploit the soil. Unlimited access to the sea endangers productivity and beauty. And even natural parks are endangered by too many visitors. Since Hardin's contribution to the commons, the label 'tragedy' sticks to environmental goods such as lakes, the seas, and land. Yet, Hardin's analysis overlooks one special trait of the commons. He identifies the commons with open access-regimes. Recent contributions in public goods-theory, instead, lay emphasis on the fact that the goods that Hardin identified as public goods are *not* non-exclusive goods in the strict sense (Kallhoff, 2011; Kaul *et al*., 1999). Instead, all that can be said is that the patterns of

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exclusion are irregular and often not clear-cut. In particular, common pool resources are characterized as goods which are – to some degree – non-exclusive. This definition serves as a starting point for political scientists and philosophers to discuss mechanisms and strategies to regulate access.

Obviously, some critical environmental goods belong to the group of common pool resources. As goods whose entrance barriers are not clear-cut, the seas and lakes, space in terms of land and soil, water systems and even the sunshine qualify as common pool resources. Applying the category of public goods to natural goods is particularly helpful in understanding two unresolved problems regarding natural resources.

First, common pool resources stimulate a behaviour which was classified as 'free-riding'. Some authors argue that rational decisions regarding these goods need to be compared to a situation which was illustrated in the 'prisoners' dilemma' (For a critical reassessment see Little, 2002). As goods whose access conditions are not regulated, a rational person will not invest in these goods voluntarily, even though it would be the overall best solution for this person and further persons involved in them. As for environmental goods, the category of common pool resources has *explanatory force*. It helps to understand dilemmas which were analyzed in public goods-theories as problems of collective action (Tullock *et al.*, 2002). In particular, these problems result in exploitation and disastrous overuse of natural goods. They are worsened by mechanisms of rivalry among potential beneficiaries. Understanding the underlying mechanisms can contribute to developing solutions to the unsolved problems.

Secondly, the category of common pool resources does not only serve as an analytic instrument; it also explains the necessity to shift the focus of attention to a debate on the underlying normative assumptions. In order to avoid over-exploitation and false use of common pool resources, regulation of entrance barriers becomes necessary. As an effect, some types of use will be rejected. Yet, for justifying this, solutions must also pass a normative test.

Moreover, the question of allowances and forbearances needs to be discussed from diverse perspectives. It implies a discussion of legitimate conditions of appropriation; it needs to articulate justified basic claims of persons in profiting from common pool resources; and it also needs to ask for the various meanings which natural goods have to persons who do not only wish to profit from them, but who also understand them as part of their culture and their identity (Kallhoff, 2011).

A normative approach to the commons

In her theory of the commons, Elinor Ostrom chooses a particular perspective on common pool resources (Ostrom, 1990, 2002). This approach is helpful in focusing on normative elements in the theory of collective goods. Even though commons differ from public goods – their main characteristics is joint supply –, the perspective on public goods-theory given in the first section contributes to the possibility to compare both categories. Both common pool resources and the commons are goods which cannot be produced by individuals. Instead, they need to be supported and regulated by societies who wish to invest in them.

Elinor Ostrom argues that commons are situated in communities. These communities develop rules in order to prevent overuse and depletion. To think of commons without such a framework of regulation is an abstraction. In reality, these goods exist within normative frameworks. The examples which Ostrom discusses comprise communal tenures of meadows and forests in Törbel, Switzerland, common pool resources in Japanese villages, irrigation institutions in Spain, Turkey, and the Philippines and the collective management of common fishing grounds in various regions of the world (Ostrom, 1990). In particular, her analysis shows that self-governed institutions of control and enforcement are an effective

way of regulating access to and simultaneously support for these goods. These common rules even play an important role for the communities: they have a stabilizing effect on them. Yet, her analysis does not go beyond examples which all meet two conditions: the goods are situated in local communities; and the local communities depend on them for their own survival.

In order to translate the examples that Ostrom discusses into modern societies and into a framework of political institutions, it is necessary to study the underlying premises which lies behind each regulatory framework. In my view, three arguments are particularly important:

- First and very basically, a critical reassessment of the political institutions which regulate common pool resources needs to include the question of why appropriation and use of common pool resources is justified. This claim holds even when property law and regulatory frameworks have already been elaborated. Different from private goods, common pool resources might be regarded as some type of collective property. Different from private goods, some common pool resources appear to belong to the heritage of societies, not of private persons alone. In his provocative contribution on collective goods, Michael Brown asks: 'Who owns native culture?' (Brown, 2003). And his answers include the view that natural goods as well as cultural goods belong to the people who cultivated the land for decades. In an extreme case, even when property rights say the opposite, the use and appropriation of common pool resources still needs to be justified.
- Secondly, in order to justify appropriation of common pool resources, the normative meanings of the goods need to be taken into account. In environmental ethics, authors demonstrate that living entities as well as nature on a large scale comprises a variety of values for persons. The same holds for natural resources as common pool resources. Land, i.e. is not only a resource, but also a realm where animals and persons can flourish and are at home. In particular, environmental goods are multi-functional goods. Land, i.e. is part of a landscape which persons enjoy; simultaneously, land is part of the water system and of the ecological system. Moreover, it is a resource for agriculture. In order to evaluate the normative meaning of common pool resources, it is necessary to take into account the many facets of their meaning for different groups of persons. Ostrom lays emphasis on the stabilizing effect which regulatory and self-imposed frameworks will have on groups of persons. In modern societies, a discussion of the many different meanings of environmental goods to various groups of persons needs to fill this normative space.
- Third, a normative discussion also needs to comprise a debate over the categories which are suited best to express the normative perspectives. Following a proposal of Hanna and Munasinghe (1995)., the 'tragedy of the commons' can be interpreted as 'an environmental outcome that results from an inadequate specification of property rights to environmental services' (Hanna and Munasinghe, 1995: 15) In particular, property rights relate ecological systems to human systems (Goodin, 1990). In order to develop optimal fit, legitimate interests of profiteers need to be outweighed against conditions of legitimate use which focus on whether or not the resilience of a natural system is endangered when the legitimate interests are being met. Besides discussing methods of good governance, this normative background also needs to be explained. Normative theories on property are one path which according to Ostrom *et al*. helps understand the complex link between common pool resources and the commons (Ostrom *et al*., 2002).

So far I have argued that the theory of public goods as applied to environmental goods has two advantages. *First*, it helps understand a critical problem: it contributes to the view that natural resources need to be surrounded by barriers which regulate the entrance. *Secondly*, it also points to a normative direction. It says that without a thorough examination of normative assumptions, this regulation will not meet the test of legitimacy. In particular, this approach to the commons argues for the general claims that appropriation needs to be justified in each case, that the normative meaning of environmental goods for various persons need to be made explicit, and that a normative theory of property rights might be one way of channelling access to common pool resources.

Another promising approach to discuss the legitimacy of appropriation is provided by theories on environmental rights. Even though it is not the place here to explain these approaches at length, some comments shall be given on why these approaches are particularly important in debates about common pool resources.

Environmental rights and the concept of group rights

The discussion of common pool resources leads to the debate on justified claims in profiting from natural goods. In ethics, the most basic legitimate interests of persons have been discussed in terms of basic rights or human rights (Freeman, 2011). Many constitutions and international contracts also imply a list of environmental rights.

On the one hand, environmental rights appear to be suited because they are restricted to most basic interests of persons. In particular, environmental rights can be derived from the right to good health and freedom from environmental hazard. On the other hand, environmental rights can be criticized as normative claims which are too general and therefore also too less specific in dealing with environmental challenges. As for legitimate interests in common pool resources, this is a major flaw. Common pool resources need regulatory frameworks which relate to the given local circumstances and the particular groups of persons who are interested in profiting from them.

The view which I shall discuss in the reminder of this paragraph does not focus on environmental rights alone. Moreover, it is not the place here to discuss environmental rights in more length. Instead, it adds the category of group rights to the discussion on environmental rights. In my view, the category of group rights can mitigate some negative side-effects of the more general category of basic rights. In particular, this category appears to be suited for discussing the balance between legitimate interests on the one hand and conservationist duties regarding common pool resources on the other hand. In order to explain the interpretation of group rights which I shall start with, I shall first give a short summary of the category as introduced by Will Kymlicka.

When Kymlicka introduced the category of a group right in political philosophy (Kymlicka, 1999), two insights were critical: *First*, in multicultural societies, the state promotes certain cultures and also disadvantages others; therefore the question of justice for minorities needs to be raised. *Secondly*, persons derive their values from communities; yet they also are to some degree independent of them. Group rights serve the aim to protect these communities; yet, they are not extensions of liberal rights, but rather reservations to individual rights (Kymlicka, 2001, 2007). In order to apply the category of group rights to collective goods such as common pool resources, a further distinction needs to be made. As minority rights, group rights might either refer to rights of minority-groups members or to collective rights of minority groups. In my view, the latter is suited to respond to the normative layer of common pool resources for two reasons.

First, interests in benefiting from common pool resources gain legitimacy through a process which identifies not primarily most basic interests, but most basic interests which are simultaneously shared by persons who identify as a group. Besides most basic interest such as interests in a healthy environment, fundamental interests can also be identified as interests that are shared by a group of persons who profit from that good. In order to avoid misunderstandings, it is necessary to add that the debate on group rights does not replace the debate on environmental rights. Instead, it adds the insight that some rights have the status of collective rights. Since decisions over environmental goods frequently depend on an unequal share in power, these groups might simultaneously be disadvantaged. Moreover, they might deserve the name 'minority' in terms of groups of persons whose interests are often not main stream-interests. Yet, the justification of collective rights also addresses the questions of how common pool

resources belong to the culture of a group and whether or not duties of stewardship have already been carried out by that group.

Secondly, in multicultural and liberal societies, interests in common pool resources cannot entirely be judged against the background of environmental rights. Instead, persons have diverse interests. These specified interests often do not relate to health issues alone; they rather portray the preferences which persons have. Usually, basic rights and individual interests are two extreme cases on a scale which measures the objectivity and urgency of interests. Again, collective rights might add a reasonable way of integrating interests which do not belong to both categories.

Environmental rights can be subdivided in several groups of rights. In particular, procedural rights such as the right to information, the right to participation in democratic processes also belong to the group of environmental rights. In order to give groups and minorities the chance to articulate rights which they claim for themselves, these procedural rights are critical. In order to defend collective rights regarding common pool resources, the procedural rights have a protective function. Moreover, they are necessary in order to give groups the chance to demonstrate that their interests really are basic. Even though the articulation of legitimate interests is an open process, explaining them in terms of group rights implies a second step. It says that these rights are not only basic in terms of general environmental rights, i.e. the right to have access to healthy water and food. Instead, it implies that groups could defend a set of special rights through mechanisms which imply open access to information and a defence in the public.

Summary

Many critical environmental goods belong to the group of common pool resources. These goods suffer from access conditions which are not clear-cut. Yet, this situation also contributes to questioning the underlying normative presumptions. In order to make a normative layer explicit, some aspects of the normative background of Elinor Ostrom's theory of the commons were outlined.

Even though this short discussion could not include solutions to the tension between the claim (1) to respond to justified claims of potential profiteers of common pool resources and (2) to prevent them from false use and from exploitation, two ideas of how this tension could be addressed were outlined. *First*, common pool resources can be regarded as a special type of collective property. Property rights do not result from contracts alone, but also imply a normative dimension. In particular, concepts of 'heritage', of already delivered duties of stewardship and of cultures which respond to common pool resources need to be taken into account. *Secondly*, environmental rights are a necessary tool for distinctions between fundamental interests and mere preferences. Yet, in order to give a more appropriate distinction between justified interests in common pool resources and mere preferences, a theory of group rights needs to complete the theory of environmental rights. As Kymlicka states, group rights help correct the focus on individual persons. Moreover, procedural environmental rights serve the aim to give a voice to groups which need access to common pool resources and who suffer most from exploitation and overuse.

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A global solution to land grabbing? An institutional cosmopolitan approach

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Abstract

Even though land grabbing entails positive outcomes in terms of investments in poor countries, concerns about detrimental effects have been voiced by the World Bank (2011) and the UN Special Rapporteur on the Right to Food, Olivier De Schutter. They express concerns about violation of human rights. A significant driver motivating land grab is the promotion of biofuels (Clancy, 2008). Even though biofuels are generally considered a sustainable solution, it is widely contested whether they escape potential negative effects (Thompson, 2008). In this paper I will discuss ethical arguments concerning land grab in regard to biofuels and human rights. The paper proceeds as follows: (1) A paradigmatic case of morally bad land grabbing driven by biofuels is defined. I call this the 'Food vs. Fuel-Land-Grabbing' (FFLG) case; (2) the categories of human rights relevant to land grabbing, based on De Schutter's UN recommended list of rights, are discussed. The human rights approach is equivalent to the promotion of a global *code of conduct* on land grabbing; (3) the critical claim that human rights based responsible investment-approaches will only lead to more morally bad land grabbing is presented; and (4) this will provide the cue for arguing that a pluralist and institutionally sensitive sort of cosmopolitanism is needed in the moral argument against bad land grabbing driven by biofuels as exemplified in the FFLG case.

Keywords: large-scale land acquisitions, biofuels, human rights, ethics

Introduction

Recently, the UN Special Rapporteur on the right to food, Olivier De Schutter, made a strong statement about how not to think about Land Grabbing (De Schutter, 2011). He claims that the current debate has started off on the wrong foot by focusing too much on ensuring so-called responsible investment in developing countries and too little on the structural forces that keep poor people stuck in poverty. In his claim De Schutter seems to be at odds with his own aspirations of promoting a human rights framework unto the manifold processes of land grabbing – not to mention the aspirations of the World Bank and IFPRI (International Food Policy Research Institute) which have both promoted a code of conduct on large scale land acquisitions (LaSLA). De Schutter's remark could be seen as an acknowledgement of the more critical agendas of NGOs, like the *Via Campesina*, who restate the traditional Marxist scepticism about human rights as a good remedy to solve structural inequalities. In order to reflect on the concern about human rights and land grabbing raised by De Schutter, I suggest looking at how current cosmopolitans invoke human rights in conjunction with an equally significant concern for institutions as the necessary conditions to fulfil rights, so-called institutional cosmopolitanism (Pogge, 2002: 169-177). The argument that I will give is an outline of how far the institutional global order relevant to land grabbing should remedy the injustices of that phenomenon.

I start out by outlining what is wrong in land grabbing, taking my cue from the case of biofuels as drivers of land grabbing resulting in the stylized 'Food vs. Fuel-Land-Grabbing (FFLG) case'.

A final introductory remark about climate change and land grabbing: a key driver in land grabbing is climate change. In particular the demand for biofuels in the developed countries seeking to leave a

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fossil-fuel based economy behind is driven by the policy of mitigating climate changes, e.g. the European Renewable Energy Directive (RED). And, since an estimated 35% of all LaSLA is driven by an increased demand for biofuels (De Schutter, 2010), climate change is indirectly a major driver of LaSLA. However, in this paper the focus is on the justice of institutions that might regulate bad land grabbing, leaving the issue of climate change in the background, even though it can explain why land grabbing is exacerbating.

The Food vs. Fuel-Land-Grabbing (FFLG) case

Clearly, land grabbing defined as the stealing of land from poor people whose livelihoods depend on the land (for generations) is morally wrong. In order to carve out the 'wrongness' in land grabbing as it is seen from a common lay people or global media point of view, I suggest the 'Food vs. Fuel-Land-Grabbing' (FFLG) case. The case is more or less equivalent to the one described by Borras and Franco (2010: 15, as type B1). The Nuffield Council on Bioethics (2011) also mentions the 'fuel vs. food' debate as paradigmatic to the ethics of biofuels in general, though they also state that the evidence of biofuels driving up food prices is limited. So, I do not intend to claim that FFLG is *the* problem that needs prior attention, only that it works to exemplify the core of ethical intuitions often connected with biofuels and land grabbing.

So instead of aiming at an analysis of biofuels and land grabbing 'in total' seeking to answer if land grabbing driven by biofuels is good or bad per se, I will look at the case where:

1. The biofuels are first generation (based on crops that are also used for human food such as wheat and maize).
2. The biofuels are produced in a developing country in large-scale farming (industry) with the aim of being exported to a more well-off country (not necessarily a rich Western country) for the use in fuels for transporting.
3. The biofuels considered are grown on land that has been 'sold' or taken over by a private company or government in a more well-off country with the intermediary assistance of (corrupt) domestic government administration and power elites.
4. The land belongs to indigenous people who have no formal legal property rights to the land, only customary use-rights, and the land is considered partly marginal waste land, but it is used by pastoralists, women and fishers to provide for their livelihoods.

I will call this the 'Food vs. Fuel-Land-Grabbing' (FFLG) case.

I admit that focusing on this 'paradigmatic' example provides an early bias towards an ethically negative conclusion; however, I think that it is needed to first focus on clear cut cases where the ethical analysis is on relatively safe ground before proceeding to the more complex and problematic cases where to the analysis should eventually lead us. Hence, my argument will not cover the general case of LaSLA, which might be more positive, only the FFLG case is covered.

Human rights relevant to the case of land grabbing and biofuels

The most comprehensive analysis of human rights in regard to land grabbing is to be found in the reports and articles from the UN special rapporteur on the right to food, Olivier De Schutter. However, he does not take any distinctive view about biofuels as a driver of LaSLA (De Schutter, 2010: 308). To get the particular view on biofuels the Nuffield Council on Bioethics report on the ethics of biofuels is more relevant, but, unfortunately, land grabbing and LaSLA are not explicitly dealt with.

As De Schutter points out, there is already an abundance of references in existing human rights declarations and covenants that are relevant to the case of land grabbing. However, De Schutter warns

that even though entitlements to land are widely recognized in current human rights, there is no self-standing right to land:

> International human rights treaties do not recognize a right to land as such. But such a right may be grounded in either the right to property or in the right to food (De Schutter, 2010: 305).

Apart from arguing for a human right to land, De Schutter recommends that LaSLA complies with 11 human rights principles which are in full alignment with The World Bank and IFPRI's notion of promoting 'responsible investments' in foreign land, *viz*. a code of conduct (De Schutter, 2009: 5; Von Braun and Meinzen-Dick, 2009).

The Human rights principles are (De Schutter, 2009: Appendix):

- Deals on LaSLA should be transparent for all stakeholders.
- Deals on LaSLA should provide the peoples who sell their land 'free, prior and informed consent' and remedies when they justifiably need to be evicted from their land.
- Host states should protect their people's human rights by incorporating these into their laws.
- Investments in LaSLA should promote well-being and development.
- Investments in LaSLA should contribute to increasing employment.
- Investments in LaSLA should contribute to promoting sustainability: protecting the environment, mitigating climate change and not depleting non-renewable resources like water.
- The human rights principles should be enforceable by stating sanctions in the land deals
- Local food security should be of priority over exporting needs.
- An impact assessment of the land deal showing impact on social and environmental indicators should be done in advance of any negotiation.
- Indigenous peoples right to land, whether by formal or customary use-law, should be respected.
- Workers' rights according to the ILO convention should be respected.

In this list of human rights principles, all of which are derived from existing human rights law, there is a mixture of types of rights with an overweight on what could be called negative rights, i.e. rights that say what 'not' to do, or what should be respected, not interfered with, etc. The procedural rights are somewhat in between positive and negative rights, but possibly would be grouped with democratic rights of fair procedure. The three principles that say that investments should promote development, employment and sustainability could be read as positive rights, since they demand that an effort should be made that goes beyond mere negative duties not to harm. De Schutter stresses that the human rights principles are *minimal* and provisional until a more operational guideline is available (cf. Pogge's distinction between *moral* and *legal* human rights, Pogge, 2011: 27). This means that they are not sufficient to ensure that a land deal is carried out responsibly. De Schutter also points to an important weakness in the current human rights system. There is some protection of the customary rights of land users and indigenous peoples' right to land. However, in many developing countries a majority of the rural poor have no sorts of rights to land, resulting in an estimated half a billion people living today on the brink of food insecurity (De Schutter, 2011: 256). Hence, De Schutter argues for land reforms with the aim of distributing the ownership of land more equally (De Schutter, 2010: 334).

A critique of human rights and a global code of conduct

Saturnino Borras and Jennifer Franco in their 'Towards a Broader View of the Politics of Global Land Grab: Rethinking Land Issues, Reframing Resistance' (2010) take a critical view on the approach:

> In short, part and parcel of CoC (code of conduct) proposals is an uncritical belief in the basic beneficence of formal and legal measures such as clearer contracts, clearer and more secure property rights (usually interpreted as private and individual rights), transparent contracting, FPIC, and state-civil society partnership. Each of these, in itself, is not necessarily bad; each could have merit

> depending on a particular context. But none is inherently good in that none can guarantee truly pro-poor outcomes. In the absence of a clear framework and process that insists on prioritizing truly pro-poor outcomes, the weaknesses of these various elements are more likely to be reinforced when framed within a win-win, voluntary CoC as the response to the global land grab. (Borras and Franco, 2010: 12)

Borras and Franco basically see a CoC on land grabbing as a formula in the guise of 'responsible investment' and as an extension of the existing 'global industrial agro-food and energy complex' (*ibid*., 9). Hence, the critique runs deep in the opposition to current liberal oriented development policy regimes. Borras and Franco also point to the general philosophy that permeates the arguments of the neo-liberal development policies, stating/claiming that land grabbing is inevitable and that 'real land reform is impossible' (*ibid*. 12). The harsh criticism launched against the major development institutions is answered to by the IFPRI expert Ruth Meinzen-Dick in 'Necessary Nuance: Toward a Code of Conduct in Foreign Land Deals' (2009). Meinzen-Dick explicitly rejects the simplifying two narratives approach to current LaSLA – the 'beneficial investment' narrative versus the 'neocolonial land grab' narrative (*ibid*. 75).

According to Borras and Franco the alternative to a neoliberal code of conduct approach is invoking the concept of 'land sovereignty'. Land sovereignty reinstates the people and the class as historical, real, social relations. Land sovereignty opposes the concept of land governance that relies on an abstract logic of property, state-centrism and control, measurement of land and neglect of the inner tension of interests found among people within local communities. Land sovereignty is defined as: '[..] the right of the working class people to have effective access to, control over and use of land live on it as a resource and territory' (*ibid*. 35).

However, the definition is obviously discriminatory in only entitling the working class with 'sovereignty'. That said, I also think that Borras and Franco deliver a profound and thought provoking attack on the sometimes too naïve belief in liberalism as the guiding principle in development politics. The notion of land sovereignty goes beyond the human right to have property protection and the right to access to food in claiming that the poor are entitled to land.

An institutional cosmopolitan view of the FFLG case

In this final section I will draw on the current discussion within global justice theory. I think that the theory of Thomas Pogge claiming that the global rich should not participate in a global basic structure of trade and regulation that is to the disadvantage to the global poor is relevant to the case of Land Grabbing (Pogge, 2002, 2011). Pogge is also a defender of human rights, but at the same time he uses the Rawlsian basic structure argument as a normative driver in support of global justice. Recently, Charles Sabel and Joshua Cohen (2006) have shown that global justice theory needs to take into account the pluralistic structure of a global basic structure *pace* Rawls. This kind of institutional pluralism is, I think, highly relevant to reach a better understanding of the normative complexity surrounding global Land Grab, i.e. the prospects of a global code of conduct. However, taking the cue from the 'Food-vs.-Fuel-Land-Grabbing' case (FFLG) what can this approach tell us?

FFLG tells us that the demand for biofuels drives bad land grabbing and that the benefits and burdens are distributed globally, hence the global interdependency of international trade in biofuels and land exemplify an international scheme of distribution akin to a basic structure relevant for the FFLG case. Within that structure the losers are the poor people in developing countries who only have use rights to the land. The winners are the rich who can choose an allegedly more sustainable way of transporting (I admit that the empirical evidence for the claimed sustainability of biofuels is debatable, however, the

argument only relies on the premise that the rich 'think' that biofuels are a more sustainable solution compared to the majority of current energy sources). Hence, the argument *pace* Pogge, ascribes a negative duty not to become sustainable at the price of the poor through the practice of land grabbing. Notice that this argument does not necessarily cover other cases of LaSLA, for instance the case of land grab for investment opportunities or nature conservation and tourism, even though the argument could be relevant in those cases as well.

Since the institutional regulation of this area is still only 'soft law' and not binding in a coercive sense, it seems that the FFLG case must rely on a moral cosmopolitanism in order to reach out to those who have only customary use rights to land. The objection from institutional cosmopolitanism would be that looking at the trade practices already taking place in the FFLG case provides a strong reason for accepting that a quasi-institutional scheme of trade is sufficient to ask whether the scheme is a just one. In saying that it is sufficient, I allude to the Rawlsian admission that international trade does in fact exemplify tenets of a basic structure (though nothing similar to the domestic one, cf. Rawls, 1999). Where the basic structure of international trade does not satisfy criteria of the domestic basic structure is in its lack of coerciveness (cf. Nagel, 2005). Moreover, the asymmetrical power relation in the FFLG case also does not satisfy the Rawlsian criterion of 'reciprocity' in the sense of equal cooperating parties who share the benefits from their common production.

Most relevant of the Rawlsian criteria is the aspect of 'pervasive impact' (cf. Abizadeh, 2007; Høyer Toft, 2012) – certainly, the FFLG case shows that land grabbing and biofuels have an impact on those living within the scheme, a scheme they cannot easily escape.

Conclusion

In this paper I have argued that introducing an institutional cosmopolitan approach to the FFLG case makes it clear how the rich are directly responsible for driving bad land grabbing. This provides the cue to taking into account the structural causes of land grabbing as a needed supplement to a liberal code of conduct and its human rights equivalents. This will be a critical, but still liberal, reply to the Marxist inspired scepticism invoked by Borras, Franco and the Via Campesina. Acknowledging the institutional cosmopolitan approach, the responsibility for avoiding bad land grabbing is then not only 'taken care of' by satisfying the check list of human rights and a code of conduct, it also requires that those who indirectly benefit from land grabbing, i.e. most of us who demand a more sustainable way of transportation based on allegedly more sustainable biofuels, take responsibility for not upholding the unfair institutional scheme of trade in land that cases like the popular scenario of the 'Food-vs.-Fuel-Land-Grabbing' case, so specified, exemplify.

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Climate change, intellectual property rights and global justice

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Abstract

International negotiations on anthropogenic climate change are far from running smoothly. Opinions are deeply divided on what are the respective responsibilities of developed and developing countries with regard to the reduction of greenhouse gas emissions and the alleviation of the negative effects of global warming. A major bone of contention concerns the role of intellectual property rights (especially patents) in the development and diffusion of climate-friendly technologies. While developing countries consider IPRs as a formidable barrier to the rapid transfer and the widest possible diffusion of such technologies, developed countries, by contrast, see IPRs as a vital prerequisite for the development and transfer of these same technologies. This debate shows some similarity with the earlier debate on patents and access to lifesaving medicines, although there are also important differences. In our contribution we will explore both the analogies and the differences with this earlier debate. To provide a focus for our discussion, we will examine whether something similar to the *Health Impact Fund* (HIF), which has been proposed by philosopher Thomas Pogge as a reasonable solution to the ethical dilemmas of protection and accessibility in the field of pharmaceuticals, can also be elaborated for the development and diffusion of climate-friendly technologies. Thus the central question is how an analogous 'Climate Impact Fund' would look like and how it would work. This whole exercise will also yield a normative yardstick for assessing the various designs for a Green Climate Fund or a Technology Mechanism that are currently on the table of the international climate negotiations.

Keywords: technology transfer, distributive justice, health impact fund, development aid

Introduction: from medicines to climate change

Although several developed countries, most notably the US, don't see climate change as an issue of global justice and refuse intellectual property (IP) rights to be placed on the agenda of international climate negotiations, it appears to us that this position is hardly justifiable. From the realization that the absorptive capacity of the earthly atmosphere for greenhouse gases (GHG) emissions is limited, it is a small step to conclude that the use of this scarce good represents an issue of distributive justice. The most straightforward position to take is that all human beings have equal rights to use this global 'sink' and should therefore be allotted equal quotas of emission permits. We admit that in the current political climate such a view sounds extremely radical and cannot pretend to be (politically) 'realistic', but we want to defend it as the ethical default position. Whoever wants to deviate from this line, we claim, assumes a huge burden of proof. Special pleadings (like 'the American way of life is non-negotiable') will not be allowed to pass this hurdle.

There would be no urgent ethical need to raise the issue of IP rights in connection with climate change if equal rights to use the global GHG sink were indeed a political reality. Likewise, in a world with a much more equal distribution of income and wealth between and within nations, patents on medicines would not have become a big ethical issue either. However, given pervasive socio-economic inequality, the worldwide patent system is indeed unjust because it orients pharmaceutical research to serving high-income markets and denies poor people access to affordable drugs. For climate change the ethical issue is even more salient as companies from those countries that bear a large part of the historical

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responsibility for causing global warming stand to gain from selling proprietary mitigation and adaptation technologies to the countries that will suffer most from it and see their own development prospects eclipsed. Often a deal may not even be concluded when monopoly prices make the cleaner technologies unaffordable – as if it were not in everybody's interest to realize possible GHG emission reductions immediately everywhere and not only after expiry of the 20-year patent term. Meanwhile the debate on patents has been largely narrowed down to the question whether they facilitate or block technology transfer. Numerous commissioned studies attempt to show that patents are not an obstacle after all but a facilitator for technology transfer, just like in the earlier debate on IPRs and medicines many reports 'proved' that patents are not the main barrier for access to drugs. Needless to say, such conclusions are crucially dependent on the design of the inquiry and the framing of the questions (cf. DeCamp, 2007: 82-87).

The health impact fund idea

In the pharmaceutical area, the so-called Health Impact Fund has been proposed as a remedy to address the inherent injustice of the international patent system (Hollis and Pogge, 2008). This Fund offers an alternative way of rewarding innovative pharmaceutical companies on the basis of their product's contribution to lowering the global disease burden (measured in terms of quality-adjusted life years (QALY)) rather than sales to prosperous consumer markets. Thus this impact metric substitutes for the criterion of purchasing power and thereby partially corrects the injustice entailed by the unequal distribution of the latter. It also allows to avoid the well-known deadweight losses of monopoly. One of the proponents of the Health Impact Fund has suggested a similar solution for dealing with environmentally beneficial innovation: 'So this is my proposal: a reward fund, sponsored by governments, that would offer to pay innovators on the basis of the ecological benefit of their invention on condition that they are willing to give up their patent-protected mark-ups' (Pogge, 2010: 540). In this paper we want to elaborate this suggestion for the problem of climate change by exploring the possible architecture and roles of a 'Climate Impact Fund'.

Is this idea suitable for climate friendly technologies?

Ideally, an analogous Climate Impact Fund should have a double task: reduce greenhouse gases emissions and provide relief measures for climate change adaptation. The fund should aim at a wide impact across all areas, but it becomes immediately evident that the same metric for assessing impact, and thus fixing the reward's sum, cannot be used for both mitigation and adaptation. It might be possible to construe a formula for a broad impact metric for mitigation, based on the reduction of greenhouse gas emissions against some default baseline. For adaptation, it seems much more difficult too construe such an encompassing metric, because of the heterogeneity of the various coping strategies.

Pogge is right when he says that:

> [i]n those cases of innovation where you can measure the value of the invention in respect to a socially important purpose, it makes much more sense to at least offer the innovator the opportunity to sell the innovation at the lowest feasible cost of production, and then be rewarded [by the fund] for the innovative effort... (Pogge, 2010: 540).

But this statement leaves many justice concerns open. Can we pursue this one 'socially important purpose' on its own? What is the social cost of pursuing the envisaged strategy? Are we sacrificing too much for reaching our goal efficiently? Should we use the fund to address other justice issues, e.g. like the right to share in the advancement of science?

In what follows we will deal with a series of complexities that have to be dealt with when drafting a Climate Impact Fund.

Difficulty 1: Mitigation and/or adaptation

Technologies that aim at climate change mitigation are usually not the same as technologies needed for adaptation. It is not completely inconceivable that some technologies might have an impact on both needs and special guidelines have to be drawn for those cases. A central problem will be to choose what the fund should aim at, mitigation or adaptation, or whether it should address both. If it is decided that such a fund should promote technologies that address both needs, again one has to justify what percentage of the available resources should be dedicated to each need. We could state that technologies for mitigation should receive a percentage x, taking into account the needs of future generations, the integrity of the biosphere and overall needs or wishes of the people who will be paying for the fund. Technologies needed for adaptation would receive the remaining share, while taking into account issues of global justice, here a debate has to come into place, with the mission to specify in how far issues like ability to adapt to climate change, historical emissions and vulnerability should be taken into account while determining the allocation of fund's monies.

A relevant consideration for the division of the Fund between mitigation and adaptation objectives is the following. If a worldwide emissions trading system with a cap on the overall amount of emissions (ideally based on equal per capita quotas for emission permits) were in place, the *ethical* need for devoting monies of the Fund to mitigation purposes would be correspondingly diminished. The reason is that such a system of 'carbon trade' would itself generate a strong *effective* demand for new mitigation technologies, even with a monopoly mark-up due to patents. (In such a system, poorer parties who do not need their allotted quotas to the full could sell their surplus permits to richer parties and would thus be compensated – in this way the system would to some extent take care of justice requirements). But of course, there is as yet no worldwide emissions trading system and chances that such a system will soon be installed are rather bleak. However, in the approaching post-Kyoto regime developing countries are asked to take up mitigation responsibilities even in the absence of a worldwide system of emissions trading. This would put a heavy burden on their economic development, which might be relieved by preferential access to mitigation technologies. Hence in our very imperfect real world a Climate Impact Fund could still play a welcome role in rewarding, and thereby facilitating access to, mitigation technologies.

Difficulty 2: fair shares or impact maximization?

When deciding for a broad impact metric for climate change mitigation, we should still pose the question if some areas of industry will enjoy many more benefits then other areas and if there are any immediate justice concerns with this outcome. We can recall the 'socially important purpose' of reducing greenhouse gases emissions and say that if it is much more cost-effective to reduce emissions in one particular area, there is no major counterargument for not generously incentivizing this one area. If we can easily cut emissions in this one area is due to the fact that historically no great effort was done in making that business more sustainable, would turn out to be something that will be of no practical concern for the fund.

The problem of climate change adaptation is much more multifaceted. When linking rewards to impact, no matter if focussing on one single factor or a complex algorithm for its measurement, a certain utilitarian compromise has to be made and some particular needs of minorities have often to be dropped for the sake of satisfying the well-being of larger groups. In how far a fund with the central goal of maximizing impact can forgo any issues of historical emissions and vulnerability or fail to reserve special funds for people who will continue to find themselves below a certain (even bluntly established)

threshold of well-being has to be cautiously studied, especially when it seeks the support of countries and organisations that are signatories to a series of Human Rights Charters.

Difficult 3: Low-tech or high-tech solutions?

As having an impact, especially in climate change mitigation, is not bound to providing highly scientific innovations, a restriction of what might be rewarded, and what not, has to be justified in order not to appear arbitrary or selective. Since its first formulation, the HIF has found it necessary to restrain through one way or another the type of innovations apt to be rewarded by the fund (Hollis and Pogge, 2008, 2009). This restriction favours break-through science and fails to incentivize the production of social programs or non-patentable, but potentially high impact innovations.

The strong technology divide between developing and developed countries will make it very difficult to find consensus on what kind of solutions should be incentivized. If there is a bias in favour of technology, we will not have to find consensus only among those who produce new technologies and those who do not, but also among those who are considering being the future manufacturers of the ready products and those who are not.

To take an example, we can relatively easily measure the impact an optimized engine that reduces emissions for luxury racing boats will have; it may even considerably save fuel expenses for its rich owners. On the other hand, since we cannot measure impact thus not establish reward size of a non-technological method of motivating people to live more sustainably, like making freely accessible and entertaining a documentary movie showing the vulnerable position people face in smaller Pacific islands, it will not be eligible for the funds monies, even if it will reach a much higher impact by causing a behavioural change, than the technological fix in the first case, and will definitely have secondary benefits enjoyable by many more people.

This type of problem is difficult to address, since in order for the impact fund idea to be seen as a real alternative to exploiting patents in the traditional way, it should not be perceived as prize money that one might be able to get by laudable conduct, but it has to appear as a legitimate salary. The inventor has to be able to estimate the size of the reward in order to attract investors.

Difficulty 4: Self-consuming improvements?

Pogge (2010: 542)believes that such kind of fund will incentivize the production of low-tech innovations such as improved cooking stoves. When dealing with innovations destined to people with limited resources, especially those for whom we can safely predict that they will increase their consumption as more resources come within their reach, we have to reflect on how their behaviour will change by introducing more efficient devices. It will be very welcome for the sake of public health if people with an improved stove will boil their possibly harmful water more often, as they will have more fuel disposable since they are using a more efficient stove. Controversially, the use of a broad impact metric, that measures the actual reduction of greenhouse gases emissions, will give this innovator a very poor reward or non at all.

Difficulty 5: Use and ownership of technologies

Unlike medicines most climate-friendly technologies contain a fairly big bundle of patents. The fund will not be rewarding a single object, which will be used in its original form throughout the fund's payout years. It is quite common to seek for a license to use subcomponents that will make one's invention more efficient or appealing – often on a year-to-year basis. Especially the electronics industry profits

through this dynamic. A Climate Impact Fund should maintain this dynamic and it will be quite hard, or even prohibitively expensive, to elaborate a measurement mechanism that might spell out the reward required for the fund's goal.

Technologies become obsolete not only with an evolving state of the art, but especially with agricultural innovations, through a change in environmental conditions. Here again the mechanism should not incentivize the production of seed varieties that will too soon become inappropriate for the targeted number of beneficiaries.

A global justice conception

The mentioned difficulties raise multiple questions of distributive justice. Can we establish a climate impact fund without a shared notion of global justice?

As far as this very preliminary exposition shows us, we have come to the conclusion that establishing a fund for the climate, in its broadest sense, will be bound to be buried in negotiation problems, as too many important sections have to be agreed upon by a huge diversity of stakeholders and a clash of conflicting values seems virtually inevitable. The impact fund idea has potential, as it could incentivize the widespread diffusion of technologies at production cost, especially the technologies designated for those with much lower purchasing power. It also gives an incentive for products to be not only sold, but for training people in using them properly (Pogge, 2010). Making use of the scalable nature of the impact fund, a proposed Climate Impact Fund should start by incentivizing those technologies whose impact can be assessed by a broad across-the-board metric (in close analogy to the HIF use of the QALY metric). Establishing a working basic impact fund that already shows some success might increase the willingness of governments to reach consensus for deciding how to incentivize the production of technologies for the other, more difficult to measure, fields of need.

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Section 3. Global warming and climate change

Global warming, ethics, and cultural criticism

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Abstract

The climate is under continuous changes due to human action. This fact raises ethical questions concerning the adaptation to the predicted changes, the duty not to engage with harmful activities, and the duties of restoration. Typically, ethical issues are addressed either in terms of individual or collective responsibility. In the former case, the focus is on individuals and on her actions and omissions; in the latter case, the focus is on the collective aspect of human life that is governed and regulated through formal institutions and structures such as legislative systems and public policies. The paper aims to study the cultural implications deriving from these ethical considerations of anthropogenic climate change. These cultural aspects seem to have a life of their own and are difficult to regulate if not specifically addressed. Accordingly, I distinguish between three approaches to environmental policy: consumerist, institutionalist and cultural. The institutionalist approach puts emphasis on legal and social structures and processes governed by formal rules. The consumerist approach focuses on the individual choices and lifestyle. I claim that to get a more comprehensive picture, attention must also be paid to cultural dimensions that are not fully governed by individuals and that either should not be controlled through formal laws in a liberal-democratic society. Such cases are stemming from various aspects of the human mobility, kinship relations, symbolic activities and rituals which can be best analysed through cultural criticism that rests on (environmental) ethical concepts and ideas. It is difficult for individuals to avoid fulfilling certain social expectations that are of cultural nature. Although visiting faraway living relatives or attending religious ceremony afar from home and thus causing GHG-emissions is, in the end, an individual decision, it has a strong cultural dimension. At times, cultural ideals can be unsustainable. It seems that the cultural approach must tackle at least two fundamental problems: First, if a cultural practice is regarded as unsustainable, its criticism might not have a recipient because it is an abstract trait of a common life of some group of people. And second, there may not be standards of criticism independently of specific cultures.

Keywords: culture, consumerism, institutionalism, custom

Introduction

In this paper, I take for granted the climate is warming because of human activities. This raises ethical questions concerning the adaptation to the predicted changes, the duty not to aggravate the situation, and the duties of restoration. Typically, the issues of human responsibilities and obligations are addressed either in terms of individual or collective responsibility. The focus is either on individuals and on their actions and omissions or on those social aspects of human life that are governed by legally recognised entities and through *formal* rules including laws and public policies. Instead of paying attention to human individuals or legal entities (e.g. states, firms, municipalities, parishes), my aim is to study the cultural implications deriving from the ethical considerations of anthropogenic climate change. The cultural realm is the world of significance. It has a life of its own beyond individual action and coordinated collective action based on formal rules.

The paper is divided into four sections. First, I shed some light on the notion of culture. Second, I distinguish between three approaches in environmental policy: consumerist, institutionalist and cultural. Third, I consider the possibility of taking a critical view on the cultural dimensions of human life.

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Such an exercise is called cultural criticism, the focus of which is here taken narrowly as informal practices and customs. Fourth, I briefly examine some case studies on gift exchange, human mobility and rituals of purification. My general claim is that if these and other alike activities are considered merely from the consumerist or institutionalist viewpoints, some essential elements of human life fail to receive proper attention and the overall criticism of unsustainable practices is inadequate. This is so because cultural dimensions are not fully in any individual's command and because these dimensions ought not to be controlled through formal laws in a liberal-democratic society either.

What is culture?

Culture is a notoriously elusive concept that denotes an intricate aspect of human existence; as a result, definitions of culture are manifold. Richerson and Boyd (2005) offer a useful starting point: 'Culture is information capable of affecting individuals' behaviour that they acquire from other members of their species through teaching, imitation, and other forms of social transmission.' The key concept here is information and it covers 'any kind of mental state' that is processed by, and stored in, the (human) brain. These mental states include propositional knowledge, concepts, know-how and social rules. What makes culture as a form of information so special is the manner of transmission from one entity to another. It occurs by *non-genetic means*, such as teaching and imitation. In other words, humans acquire cultural information through learning it from other humans.

When it comes to the nature of cultural information, it is partly *normative* and partly *non-normative* by its content. Often these elements are inseparable, like in the case of religious morality. I assume that norms constitute an instance of information although their cognitive content is about social reality composed of institutional facts, not about 'brute' facts (see Searle, 1995). These institutional facts are common knowledge about rules and norms of behaviour and this knowledge is shared by the group members (Ostrom, 1990).

The normative elements of a culture determine human relations and roles. Traditionally, these normative elements have been referred to as habits, traditions, and customs. When conceptualised in this manner, it is plausible to think that the source of habits, traditions and customs is also cultural. There *might*, however, be duties that are not culturally transmitted but are universal, such as the duty not to kill unthreatening humans. If such duties exist, how were they transmitted? Perhaps morality is innate and somehow bound to the human genetic constitution but this nature/nurture quandary is aside the main theme.

Whatever is the source of morality, virtually every theory of normative ethics has a place for cultural heterogeneity shaped through the processes of teaching and learning. As Westermarck (2001) eloquently puts it, 'Society is the school in which we learn to distinguish between right and wrong. The headmaster is Custom, and the lessons are the same for all the members of the community.' These conceptions of right and wrong, good and bad constitute the morality of a community. The concepts Westermarck uses were popular at his times; today it is common to speak in terms of practices, norms, rules and institutions (and thus to understand social life as a game that exists in virtue of rules (see North, 1990)). Institutions are, according to Ostrom (1990), 'sets of working rules' that contain 'prescriptions that forbid, permit, or require some action or outcome'.

Social reality consists of many cultural communities. A cultural community is a recognisable group of people the members of which share certain features such as language, religion, institutions and practices, art, living rhythms and division of labour. The cultural category characterises groups of humans, and their individual members cannot fully undo those cultural features that they have. Therefore, as Walzer (2005) points out, 'cultural communities are involuntary associations'. Involuntary communities involve involuntary constraints on individual life.

In the study of the normative nature of society, North (1990, 1991) has distinguished between formal rules and informal constraints. He (1991) characterises institutions as 'humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights).' Hodgson (2006) has criticised North's attempt to clarify this distinction. As he sees it, North identifies formal rules with legal rules, while informal rules are enforced by our fellow community members. Moreover, Hodgson claims that the aim of restricting the scope of formal rules to the legal rules is to neglect the fact that there are 'social orders that are not legally expressed from the category of an institution'. Hodgson (2006) refers to the social customs that exist in cultural communities, some of which are related to class structure in Britain, religion-based hierarchies in India and so on. Following Hodgson, I want to put forward a proposal that there is a social category that is neither reducible to individual lifestyle choices nor *formal* rules nor institutional structures of a society. This social category, that is, informal customs, can be simply called a cultural dimension of society, even though the term 'culture' can be understood in a broader way so as to include individual lifestyles and written laws. In the following sections, I shall attempt to clarify further the meaning of culture in the context of environmental policy and to illustrate it through examples.

Three approaches in environmental policy

In environmental policy, arguably two approaches have been dominant, the consumerist and the institutionalist. In addition to these two, I propose the recognition of third approach, which stresses the cultural dimension of human life and the importance of informal customs in working out responses to human-induced global warming.

The third, cultural approach has not always been recognised. For example, Maniates (2002) reinforces a duality of responses to environmental problems. The consumerist approach presumes that humans as consumers are responsible for environmental problems. Thus the remedial policy focuses on a specific aspect of human life. Accordingly, the virtuous consumer is a green consumer. Maniates argues that this approach individualises responsibility and claims that the formation and implementation of environmental policies should be left to the individuals who in the role of consumers participate in the formation of environmental policies. Maniates goes on to say it leads to depoliticisation of environmental policy and the loss of 'room' for debate about institutions. It is a conservative force that 'legitimizes existing dynamics of consumption and production'.

Maniates sticks up for institutionalist approach and the repoliticisation of environmental policy. He acknowledges that institutional thinking has an individualistic edge, but individuals consider themselves more as citizens than as consumers. The citizens have different channels of making impact to the society and thus can participate in the formation of 'broader policy and larger social institutions'.

In my view, the focal point of the institutionalist approach is on the economic, political and social actors, structures and processes governed by *formal* rules (that are often coercive). Moreover, some of these actors have power to invalidate existing rules or replace them with the new rules. These changes are predominantly carried out in legislative bodies and courts. The consumerist approach addresses the individual lifestyle with the confidence that consumers will response to global warming through choices. To obtain a more comprehensive picture of the human life, attention must be paid to the non-formal social dimensions that are not fully governed by individuals and that either cannot be controlled or we do not wish to control them by formal laws in democratic and multicultural societies. In other words, we need to complement the variety of approaches with a cultural one. These three approaches are, above all, theoretical constructions that can be separated from each other as long as 'culture' is understood in the narrow manner.

It is important not make too stark contrasts between position because these approaches share many features. First, they all can be individualistic in the sense that the roots of the reforms are in individuals. Second, consumerist approach requires larger systemic changes, such changes in production and distribution processes. And these changes may rest on self-regulation of the sector: relevant actors mutually agree to implement certain constraints within which to act. Cultural and legal changes outside the realm of business parallel it. Despite these similarities I think there is a place for cultural approach in environmental policy.

Cultural criticism

Cultural criticism is the critical reflection of the content of the information being transmitted non-genetically. Humans are cultural beings who adopt their views as they raised in their communities, and therefore they might avoid subjecting beliefs and customs they acquire from their communities to critical reflection. As Westermarck (2001) puts it, 'in every society the traditional notions as to what is good or bad, obligatory or indifferent, are commonly accepted by the majority of people without further reflection.' Walzer (2005) echoes this by stating that 'most humans, given their cultural and political education, will 'choose' what they have been given. Even the rebels and revolutionaries among them are likely to oppose only some part of the given world.' North (1990) also denies the possibility of a rapid cultural revolution: 'Institutions typically change incrementally rather than in discontinuous fashion. [...] Although formal rules may change overnight as the result of political or judicial decisions, informal constraints embodied in customs, traditions, and codes of conducts are much more impervious to deliberate policies.' As far as these opinions hold, it is virtually futile to exercise cultural criticism with an aim of a quick change. (There are exceptions; because of the swine flu epidemic in winter of 2010-11, people stopped handshaking virtually overnight.) Actually, many of us who either look at one's own culture or keep an eye on other cultures are highly critical of what we come across, but at the same time we are ready to defend our customs because they are so meaningful to us.

At its broadest, cultural criticism is a systematic evaluation of all of those elements that make up a society. These elements include actual beliefs and attitudes, individual lifestyles, practices, formal and informal institutions and established social hierarchies and so on. In this respect, culture is ever-present. However, in this paper cultural criticism is understood narrowly as a critical study of informal practices and customs from an ethical perspective. Thus, cultural criticism could be understood as a criticism of those common behavioural tendencies that do not consist in purely individual preferences and that are not wished to be governed by formal laws (e.g. no one suggested to criminalise handshaking during the epidemic). Two questions need to be addressed in this case: (1) what does it precisely mean to take ethics as a basis of an analysis?; and (2) what is the specific target of criticism when it is said to be 'culture' or 'informal social reality'?

As regarding the former question, ethics is one platform for exercising cultural criticism, as ethics is systematic and critical examination of actual normative systems, including laws, customs, and the etiquette. There is, however, the fundamental question concerning the basis of moral evaluation. I assume that the sources of critical reflection of one's own or other peoples' cultures stem from human rationality, uncoerced reflection and open discussion. (Criticism can, naturally, stem from emotional and other non-rational sources but philosophical and reflective criticism is not purely emotion-based.) Consider human-induced global warming. It will have damaging consequences in overall, and therefore we should identify the relevant human behaviours and assess them critically. This reflection can produce a proposal for cultural transformation the justification of which is the fact that it is in people's best interest not to warm the globe any further. It should be noticed that the term 'culture' is often used both to describe what has existed or exists at the moment and to outline the standards of cultural criticism. In the latter case, 'culture' is used in a purely normative sense with an aim to capture an ideal society and

deviations from it. In environmental debate, many social critics (e.g. Plumwood, 2002) have argued that the dominant Western culture is unsustainable and in need of reformation.

The latter question is the following: when we assert that a culture *P* or a cultural feature *Y* is climatically unsustainable, what exactly is the target of our critical judgement? The notion of culture is related to the concept of community and social group. Communities and social groups are regarded as having a culture of their own. Therefore, these collective entities exist to some extent through their cultures. Culture is also a normative system. However, I have used the term in a narrower way and excluded the formal, largely written legal system. Furthermore, cultural criticism is not merely concerned with the individual lifestyle choices or plans of life. As much as legal criticism can be understood as criticism of existing laws and their interpretations, criticism of consumption can be understood as an individualised form of social criticism. Culture is not something that any one individual may alter as one sees fit because it is jointly produced and sustained. As Ostrom (1990) has pointed out: 'Individuals have shared a past and expect to share a future. It is important for individuals to maintain their reputations as reliable members of the community.' Therefore, cultural criticism is not reducible to the criticism I am subject to as a consumer or as a voter. Cultural criticism focuses on cultural properties of a human community.

Cultural criticism in practice

Let us look at three cases – gift exchange, travelling, and purification – that are of cultural nature and that have climatic dimensions in a sense being complicit in the warming of the globe.

Gift exchange is a long-standing practice in most cultural communities. It may, however, lead to unnecessary and unsustainable consumption. One of the most obvious cases is a child's birthday party that could be seen as a celebration of plastic (it has, of course, other meanings too). The following applies at least to the urban, middle-class, present-day Nordic country: if the invited guest fails to bring a present to the birthday boy, he will be considered impolite and he might think to have let himself down in the eyes of the host. If the children are not following the custom, the psychological and social costs can be unexpectedly high taking the form of for instance bullying or social exclusion. The only way out of environmentally and socially troublesome situation is a commonly acknowledged change in the expected behaviour, in a cultural custom, so that both parties can save their faces when not participating in the practice of gift exchange (as it now exists). Regarding minor consumables, the practice of gift exchange cannot be controlled and regulated by formal instructions: there is no point having such legislation. It can neither be given up by individuals alone because of the aforementioned costs. Therefore, a cultural change plays an important role as a response to global warming.

Travelling is an important element in many cultures. This also means that people do not travel to solely satisfy their individual desires or because of the governmental obligations but rather it is customary and socially expected. Recreational tourism, religiously motivated travelling and reinforcement of kinship ties are among the main reasons for human mobility. Consider academic culture and conference participation as an essential part of a career. Often, participation requires flying. Somebody might object that the best option (climatewise) is to stay at home and to rely on a teleconference technique. This option makes possible only a partial participation, since often it is the case that the best debates in a conference are those that take place outside the formal programme. If we like to make a full contribution to a workshop, we have to be present. If we like to network, we should also be present. And to be present requires travelling that implies GHG-emissions. Therefore, as far as we exercise cultural criticism, we should pose the question whether it is morally acceptable to organise a face-to-face conference and whether this format is something that should advance the career of its participants. Some people have individually decided to reduce or even to refrain from taking part in conferences but this possibility is limited to established professionals; the general academic ethos and the standards of excellence in the

academic world still regard such activities highly. Therefore, it is the academic culture that clashes with GHG-emission reduction policies.

Sauna has a long history in the culture of northern peoples, most notably in Finland. Today most Finnish houses have sauna facilities. As explained in the Wikipedia, 'saunas are not associated with sex and sexuality. Quite the contrary, historically saunas have been the most sacred places after the church'. This is, of course, an idealised and puritan (and therefore unintentionally comical) view of the function of sauna in the Finnish culture. Saunas, however, are not a wholly positive phenomenon because many of them consume a lot of electricity and therefore are a source of GHG-emissions.

These are forms of cultural behaviour in the sense that they are not necessities for individuals; in other words, birthday boys and girls survive without presents, academics without conferences and Finns without sauna (although they have to look after their hygiene somehow). Nevertheless, the cultural groups would not be the same if these behaviours disappeared because the sense of commonality depends on joint activities.

There are some forms of cultural behaviour that might be thought of as religious obligation and thus beyond criticism. Religious tourism is a case in point. Most notably, a virtuous Muslim makes a Hajj at least once in a lifetime. Hindus and Christians have their own traditions of pilgrimage to holy sites. These traditions do not only face difficulties because of GHG-emissions but also because of the crowdedness of the world. It is infeasible that all of Muslims – perhaps 1.2 billion people – can actually make the Hajj simultaneously. This fact alone raises the question about meeting the cultural and religious obligations in alternative ways. Seeking such alternatives require cultural innovation and renewal as well.

When we focus on the cultural dimensions of climate change, we are able to raise questions that people do not often wish to be raised. It could be argued that acting upon one's cultural traditions is not a secondary but a primary interest for people (cf. Kymlicka, 1995). This is to say that cultural traditions are essential to human identity and they promote the quality of life; denying the right to keep them alive would be a gross neglect of human rights, equal to denying access to food and water, to shelter and to decent physical environment. Applying this idea to the climate debate, we may wonder whether such long-lived cultural practices and religious prescriptions really are in the primary interest if they are unsustainable. In principle, we are free to ask whether it is morally acceptable to attempt to meet religiously or culturally important but climatically suspect demands. The idea of the distinction between primary and secondary interests embodies in global warming debates as the distinction between luxury and survival emissions (cf. Shue, 1993). The meaning of those cultural practices depicted above has adapted to varying circumstances and evolved in time. As often in ecological matters, the viability of a culture depends on its adaptive ability. In this situation, hanging on to one practice despite the significant problems it causes is not rational, neither from the point of view of cultural survival nor from the point of view of human survival. Therefore, the argument from the primacy of cultural practices has its limits (cf. Aaltola and Oksanen, 2002).

Concluding remarks

In cultural criticism, the legitimacy of a cultural practice cannot be presumed. Anthropogenic climate change is partly a cultural phenomenon; partly a source of the problem and thus the response must be cultural reforms. Most people are ready to consider that both formal institutions and individuals as consumers are responsible for contributing to the climate change. I do not want to deny the importance of individual responsibility or the weight of social institutions but rather to complement them with a cultural element.

Although cultural criticism might be far more looser or unspecified when compared with consideration of the matters of law, there must be a place for it. Cultural criticism is a form of social criticism that does not aim to reform legislation; rather it aims to affect people and their understanding of things in the world of significance. In other words, it does not necessarily aim to criminalise cultural customs or transform informal rules into formal rules but to submit them to a critical analysis from an environmental ethical perspective. Philosophy carries, arguably, a lengthy history of exercising cultural criticism.

It should be noted that as far as my critical analysis holds, the judgments presented in the case studies can be considered the cultural implications of climate change, the phenomenon we would like to avoid in the first place. In this respect, I do not claim that gift exchange, academic customs, maintenance of family bonds through visits, pilgrimages and saunas are intrinsically morally suspect (although there is a possibility to consider them bad on the basis of established cultural standards; they might harm someone, as is the case of circumcision or genital mutilation.) They are different, say, than such traditions that promote inequality and coercion, the suppression of women or cruelty to animals. Because of this feature, it is apt to say that these traditions are victims of global warming – in the sense of becoming objects of criticism due to their being so successful.

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The ethics of climate change denial

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Abstract

For almost 30 years there has been a scientific debate on climate change. Most of the participants agree that consensus has been reached that there is enough evidence of human causation of recent observed warming, even if this is not a completely settled matter. This body of evidence, it is claimed by the majority of scientists and politicians, is needed to understand how to protect the world from potential harms. However, there remains a minority of scientists and politicians who claim that there is no evidence for the human causation of global warming. This minority, the so-called climate change deniers, believes that policies to reduce emissions of climate-altering gases will have a devastating effect on jobs and the overall economy. In their attacks on these views of the climate change deniers, the majority not only blames them for an outright distortion of climate change science, but also claim that disinformation about the state of climate change science is extraordinarily morally reprehensible. Their argument is that climate change denial will lead to non-action in reducing climate change's threat and will cause severe consequences for the poorest people in the world. In their view climate change deniers put the human species at risk. In this paper I will analyze and evaluate the claim of the majority that climate change denial is an ethical issue, and not only a scientific matter.

Keywords: disinformation campaign, harming, moral debate

Introduction

For almost 30 years there has been a scientific debate on climate change. The majority of the participants agree that consensus has been reached that there is enough evidence, even if this is not a completely settled matter, to underpin two claims: our climate has become warmer on a global scale, and humans have caused this global warming. Although the term 'climate change' strictly speaking refers to changes in climate brought about by any cause, it usually refers to anthropogenic climate change: a change in climate brought about by humans (Hulme, 2010).

This body of scientific evidence, it is claimed by the majority of scientists and politicians alike, is needed to understand how to protect the world from potential harms. In their view these human-caused harms include the disastrous consequences of floods, loss of biodiversity, shortage of water, rising sea levels, and heat waves. However, there remains a minority of scientists and politicians who claim that there is no evidence for the human causation of global warming. They believe that policies to reduce emissions of climate-altering gases will have a devastating effect on jobs and the overall economy. Also climate change policies would cost too much, would hurt consumers, and hamper economic growth. These assertions of the minority have consistently been challenged and refuted by the majority, the climate change supporters. In their attacks on these views of the minority, what they call the climate change deniers, they not only blame them for an outright distortion of climate change science, but also claim that disinformation about the state of climate change science is extraordinarily morally reprehensible. Their argument is that climate change denial will lead to non-action in reducing climate change's threat and will cause severe consequences for the poorest people in the world. In their view the human species is at risk. In this paper I will analyze and evaluate the claim that climate change denial is an ethical issue, and not only a scientific matter.

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Two debates on climate change

In the beginning of the debate on climate change the focus has been on the scientific claims of the natural sciences. Climate change was framed as an overly physical phenomenon (Hulme, 2010). In 1988 the Intergovernmental Panel on Climate Change (IPCC) was created. By examining technical literature it aims to assess the scientific evidence for climate change. The IPCC consists of three working groups: on the physical basis of climate change, on the possible impact of climate change and on mitigation strategies. These working groups produced a lot of data and models. In about twenty five years the work of the IPCC has articulated the 'consensus view': 'a consensus about the fact that the planet is warming, that this warming is largely human caused, and that under business-as-usual we are headed to potentially catastrophic impacts for humans and the natural resources on which life depends.' (Brown, 2011) The reports of the IPCC are considered to be authoritative by people working on climate change (Garvey, 2008) and are used to explain and predict all kinds of negative effects of global warming caused by humans.

More and more the climate change debate has developed from a scientific debate into a moral debate. The ethics of climate change has become popular subject in the last fifteen years (See Jamieson, 2001; Shue, 2001; Singer, 2004). Why is climate change an ethical problem? According to Brown

> ...climate change must be understood at its core as an ethical problem because; (1) it is a problem caused by some people in one part of the world that are hurting and threatening people who are often far away and poor, (2) the harms to these victims are potentially catastrophic, and (3) the victims can't protect themselves by petitioning their governments- they must hope that those causing the problem will see that their ethical duties to the victims requires them to drastically lower their greenhouse gas emissions (Brown, 2011).

Departing from the so-called 'consensus' view, ethicists focus on the harmful effects of global warming. The high-greenhouse gas emitters are hurting poor people in developing countries who are low-greenhouse gas emitters or are emitting no greenhouse gas at all (Garvey, 2008). The ethics of climate change is about the moral demand of climate change, for example the 'polluter pays' principle, rights of future people, repairing damage, etc. There is also literature on the moral status of climate change denial. My suggestion is to distinguish in the philosophical literature between the ethics of climate change and the moral status of climate change denial.

From scientific mistakes to morally reprehensible behavior

Over the years majority of climate change supporters have several times changed the way they attacked the minority of climate change deniers in the debate on climate change as a whole. At the start of the debate the climate change supporters only attacked the climate change deniers on their scientific merits and stated that their claim, that there is no evidence that warming is caused by CO_2, is simply false. It was a debate on the meaning of the scientific uncertainty both sides agreed upon. Later on, the climate change supporters referred to the evidence in literally thousands of pages of published studies by experts and they claimed that the burden of proof has shifted towards the climate change deniers who had to provide better arguments than the experts.

More recently the climate change deniers were not only blamed for an outright distortion of climate change science, but also claimed that disinformation about the state of climate change science is extraordinarily morally reprehensible. This change can be seen in the title of the 2006 documentary film 'An Inconvenient Truth' directed by Davis Guggenheim about former United States Vice President Al Gore's campaign to educate the public about climate change. The film considers the knowledge generated by climate science to be true and criticizes the climate change deniers that their interests prevent them to accept this truth.

In 2011 Al Gore even suggested that people today need to stand up against of climate change deniers in the same way people stood up to racist comments during the civil rights movement. Gore agrees that explaining the science beyond climate change may be more difficult than confronting racism, but says the moral component is the same. In the same interview, Gore says 'Powerful polluters ... see it as a useful strategy to try to convince the public that the scientists are liars and that they're greedy and they're making stuff up. All in the service of their overarching strategy of creating enough doubt to persuade people that there shouldn't be any sense of urgency about addressing this crisis' (www.politico.com/news/stories/0811/60890.htlm#ixzz1iWCJyqNF). Gore also thinks that people who doubt climate science are the same ones who helped tobacco companies over four decades question the dangers of cigarette smoking.

The above examples show a shift from a scientific debate to a moral debate outside science. Scientific uncertainty of both the majority and the minority has first, by the majority, been replaced by the scientific mistakes of the minority of climate change deniers. In a next phase by the unwillingness of the minority to accept the truth, and finally the majority claims that climate change denial of the minority has become a morally reprehensible climate change disinformation campaign.

An ethical critique of the climate change disinformation campaign

At an event at COP-17 in Durban, South Africa on November 29th 2011, a group of philosophers and scientists, belonging to the majority, developed an ethical and moral critique of the climate change disinformation campaign. The members stress that they are not attacking scientific skepticism or the unalienable rights of individuals to free speech. Their aim is to ethically review the tactics of the climate change disinformation campaign and they hope their readers will agree that '...these are not acceptable ways of acting skeptically or responsibly but often malicious, morally unacceptable disinformation tactics that are deeply irresponsible.' (Brown, 2011) Also this group links the climate change disinformation campaign to the fight against government regulation of tobacco in the 1980's. The tactics honed in that fight are used again and have included: lying, focus on the unknown while ignoring the known, specious claims of bad science, creation of front groups, creating misleading lists of climate skeptics, think thank campaigns, Public Relations Led Campaigns to Convince the Public That There is No Scientific Basis for Climate Science, Astroturf Groups, and Cyber-Bullying Scientists and Journalists. The group concludes that people engaged in disinformation campaigns do not play by certain rules of science and propose to the replace this troublesome behavior by a kind of reasonable skepticism.

In my view only the first three tactics mentioned are about the rules of science. The first tactic, lying, is described as making untrue claims, for example, that there is no evidence of human causation of climate change. This critique is beside the point because in order for someone to lie, she needs to know the truth. Climate change deniers are able to make false claims but while doing this they don't need to know the truth. It is just matter of scientific debate about the independency lines of evidence, the strength of correlations, the fit of model predictions to actual data, etc. The second tactic, focusing on an unknown while ignoring the known, cannot just be rejected as cherry-picking the evidence. If the unknown is important enough, it could be wise to focus on it. The third tactic, specious claims of bad science, is about the characterization of matters that are not fully proven as 'bad science'. I agree that insisting on absolute proof will create a burden of proof that can't be met. However, there may be a reasonable debate about the degrees of proof.

The other six tactics may be characterized as kinds of social tactics often used by pressure groups and NGO's. Although most of them are morally questionable, they do not belong in an analysis of the ethics of climate change. Attacking the tactics of the climate change disinformation campaign is not

only problematic, but also fails to analyze the main argument of the climate change supporters: climate change denial is harmful.

Harming by denying?

The starting point of many ethicists of climate change is the harm of the negative effects of global warming (Garvey, 2008). The outcome of their analysis often is that the high-greenhouse gas emitters are morally wrong. Especially the poor people in the developing world are considered to be the victims. If the high-emitters would switch to low-greenhouse gas emissions, there still would be the matter of repairing the damage and compensating their victims. However, in the case of the climate change deniers things are more complicated.

The first complication is the possibility of 5 kinds of climate change deniers. In theory it would be possible to deny climate change all together. This kind of climate change denial is too rare to take seriously into consideration. The denial of global warming is the second kind of climate change denial. Only in the beginning of the climate change debate people were defending this position. A third position is the denial that global warming has negative aspects. A fourth position is the denial that humans are the main cause of global warming. The final, fifth position is the denial that anthropogenic climate change has negative effects. Are all of these kinds of denial morally the same? I think that the fourth position is the most important, however people who agree with this position may develop strategies to mitigate the negative effects of global warming. Are they morally wrong in doing this?

The second complication is about the framing by the majority of the minority as climate change 'deniers'. This is a one-sided, negative framing of opponents. In a scientific debate the different opponents often represent different theories of hypothesis. By referring to a certain position in the climate change debate as 'denial', already a moral verdict has been proclaimed.

The third complication is about linking denying and harming. Is there any harm in denying that the earth is round? Form a scientific perspective it is just a scientific debate. Even when there exist pictures showing a round earth from space, a ship-owner could still believe that the earth is flat and she could deny her captain to sail too far from the coast. This could potentially harm the interests of a lot of people. Likewise, denying climate change could harm people if global warming is true and the people in charge would prevent the development of strategies to mitigate the negative effects or repair the damage. It is possible that climate change denial will lead to non-action in reducing climate change's threat and will cause severe consequences for the poorest people in the world. However, it is not the climate change denier who is morally responsible but the people in a democracy who decide not to act upon her claim.

Conclusion

For almost 30 years there has been a scientific debate on climate change. The majority of the participants, the climate change supporters, agree that consensus has been reached about anthropogenic global warming. A minority of scientists and politicians, the climate change deniers, claim that there is no evidence for the human causation of global warming. Parallel to a scientific debate between supporters and deniers, also a moral debate about climate change evolved. The ethics of climate change is about the moral demand of climate change, but also work has been done on the ethics of climate change denial. In this paper I propose to distinguish in the philosophical literature between the ethics of climate change and the moral status of climate change denial. My suggestion is to focus on the more interesting ethics of climate change. The moral status of climate change denial is problematic because an ethical critique of the climate change disinformation campaign is difficult and the main argument of the climate change supporters, that climate change denial is harmful, has three complications.

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World wide views on global warming: evaluation of a public debate

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Abstract

On 26 September 2009 a public debate was held simultaneously in 38 different countries about global warming, in preparation for the climate negotiations that were to be held in December 2009 in Copenhagen (the COP15). This was the first time that an international public debate of this size was organised. In this experiment – on initiative of the Danish Minister of the Environment (host of COP15) – an effort was made to include popular voices from all over the world in the political debate on climate policy. Such a debate needs close scrutiny in order to develop lessons for new steps in global citizen participation. In this paper we want to sketch some of these lessons. We will first briefly argue that a public debate regarding global warming is necessary because of the different dimensions of uncertainty and controversy that surround this topic; global warming is a paradigmatic case of a so-called unstructured problem. Next, we will set out a number of criteria for the evaluation of debates about unstructured problems, such as 'inclusivity' and 'the absence of power differences'. Finally, we will evaluate the debate. In the debate form that was used, resembling that of the 'deliberative poll', information has to be offered in a structured manner and this leaves little room to stimulate an interaction between experts and lay people. For example, open expert controversy could have been emphasised more. This evaluation should gives us an indication of what needs to be improved in future exercises with public debate.

Keywords: public debate, complex problems

Introduction

On September 26, 2009, *World Wide Views on Global Warming* was held simultaneously in 38 countries. This public debate about climate change was organised as a preparation for the climate negotiations that were to take place in December that year in Copenhagen (the so-called COP15). The purpose of the debate was to make clear to government leaders how citizens think about climate policy and to send out a message to take with them to the negotiating table. A total of 4400 men and women of different age, nationality, ethnicity, education, and geographical origin deliberated all day about CO_2 emission reductions and fossil fuel prices. De debate was divided in different rounds centring on specific topics and after each round the participants got to vote about their preferences. The results of voting in other countries could be followed live over the internet, leading to veritable Eurovision Song contest scenes. We were present as respectively moderator of one of the debate cells and co-organiser at the Dutch debate, organised by the Rathenau Institute. It was a unique experience, especially because this was the first time that an international public debate of such magnitude was held. Was this debate successful and what could we learn from this experience for future international public debates? In this paper we will evaluate *World Wide Views* according to a set of criteria that we will first briefly defend. But before we start our evaluation we need to make clear why a public debate about climate change is necessary in the first place.

Disagreement about climate change as an unstructured policy problem

Climate change is a phenomenon that gives rise to intractable disagreement; few other areas of scientific research have led to as much controversy as the question whether and to what extent our climate is changing through human action. We can distinguish several sources of this disagreement. First of all, the

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idea of climate itself is conceptualised differently in different societies and different eras; climate has both physical and cultural connotations. More importantly, people can interpret results of scientific research about climate change differently and they can have different opinions about conducting science and about scientific knowledge as such. Climate change is a classic example of what Funtowicz and Ravetz have called a 'complex problem' within 'post-normal science' (Funtowicz, 1993). It concerns science that is applied in public issues where both facts and values are subject to disagreement and governments need to take urgent decisions, while fundamental vested interests are present (Hulme, 2009). According to the theory of postnormal science in this type of problem scientists need not only spell out 'the facts', but also need to make clear where disagreements lie, what is uncertain or unknown, and what values play a role in their scientific assumptions and methodologies. Especially because so many interests are at stake in combating climate change the process of scientific fact-finding should be more open to public scrutiny. Moreover, disagreement about climate policy can often be traced to value conflicts, sometimes on a fundamental level. An important question, for example, is how much weight we should give to the interests of future generations. Another important question is how different objects or states we value could be compared. Some argue that in principle we can assign a monetary value to everything, while others argue that no price tag can be attached to human and ecological damage caused by climate change and that such values are simply not comparable. This conflict plays a role in the discussion about tradable emission permits. Finally, the discourse about climate policy is framed by the choices of the media, administrators, scientists, and ngo's: 'no message about climate change is neutral; certain aspects of the story are emphasised and others are downplayed or ignored', due to different group's interests (Hulme, 2009: 226).

We are, then, not dealing with solely a factual problem that can be solved by scientific experts, nor with solely a value disagreement that could be solved in politics. There is disagreement about both facts and values, and these two can often not be neatly separated. In policy literature a problem with these dimensions is characterised as an unstructured problem. Besides disagreement on facts and values, disagreement already exists about the definition of the problem and about policy aims, procedures, and instruments (Hisschemöller and Hoppe, 1995). Moreover, in defended that in unstructured problems the division between lay persons and experts is artificial (Wynne, 2003). Lay persons can have a certain experiential knowledge and can challenge the knowledge frameworks of experts. Scientific disciplines are becoming more and more specialised and this leads to a certain blindness to the bigger picture. This on its own is already a reason to involve citizens in debate about climate change, but a related reason is that among 'experts' themselves disagreement exists about causes and solutions to climate change. By discussing this disagreement publicly it cannot so easily be abused by parties with vested interests. After all, there are parties – such as companies that greatly rely on fossil fuels – that benefit from scientific disagreement by casting doubt on anthropogenic climate change. Moreover, the value-ladenness of scientific research raises the question of who has the prerogative to determine what values are prioritised. Scientific experts do not by definition have 'better' values than anyone else. Furthermore, according to the theory of deliberative democracy – that justifies public deliberation – a decision is only legitimate after everyone that is affected by the decision has been able to participate in its realization (Habermas, 1996: 458). A final, more practical argument for public debate about climate change is that the implementation of measures to decrease greenhouse gas emissions will only work if as many citizens as possible live up to the rules and this is more likely to happen if these citizens support these rules. Being involved in drafting the rules could strengthen the acceptance of the rules.

Evaluation criteria

Suppose we agree *that* public debate needs to take place about climate policy, then we can still disagree about *how* this should happen. A great diversity of public debate forms exists, such as consensus conferences, citizen's juries, planning cells, and deliberative polls. *World Wide Views* could be characterised

as an adapted form of the latter. In a deliberative poll a relatively large group of citizens meets for a weekend to exchange ideas with experts and to have discussions in small debating cells led by a moderator. They have been sent information about the topic under discussion, that is as neutral and balanced as possible, to study beforehand. After the weekend everyone votes anonymously for his or her preference (Fishkin and Luskin, 2005). Is this the right debate form for the topic of climate policy and what are the pro's and con's of this choice? Elsewhere a set of criteria that a public deliberation about an unstructured problem should meet has been argued for in more detail, so here we will just briefly introduce them (Bovenkerk, 2009). A first criterion is that a debate should be open-ended. This does not mean that the debate should not aim for decisions, but rather that these decisions should be reversible. This criterion is important for two reasons. Firstly, we want to avoid that people become disillusioned if a debate has not generated their preferred outcome and feel forced to take more extreme measures in order to be heard. It has to be clear to these people that they could influence the decision making process in the future. Secondly, when we are dealing with a dynamic problem such as climate change it is very well possible that new insights emerge or new developments take place that could not have been anticipated. More specifically, this criterion means that people have a right to revision and that the public needs to have real influence on decision making processes.

A second criterion is that of inclusivity, meaning that no 'reasonable' arguments or considerations and no relevant groups of people are excluded from the debate. This criterion is based on the view that governments should respect citizens and their intellectual capacities and ultimately relies on the principle of equality. More specifically, this criterion means that all relevant viewpoints need to be heard, that marginalized groups need to have the opportunity to express their views, and that there should be open expert controversy. Moreover, if one wants to be as inclusive as possible, the debate needs to reach others than those who were present. Therefore, we also need to consider the question of how the results of the debate are made public – for example if citizens can partake in discussions via the internet – and whether sufficient media attention was generated. A third criterion is the absence of power differences. This criterion is based on Habermas' (1990: 158-159) famous slogan that decisions should be made on the basis of 'the forceless force of the better argument' and means that in public deliberation decisions should not be forced by powerful groups to the detriment of those with less power. Of course, it is difficult to envisage a public debate that perfectly fulfils all these criteria. Particularly the last criterion will be hard to realise in real-world conditions. These criteria should, therefore, be taken as ideal-typical criteria and our evaluation will consider to what extent these ideals have been met.

World wide views

In the Netherlands the participants to World Wide Views were selected by an independent market research agency. Firstly, they received especially selected information material about climate change. How objective was this information and is objectivity even possible in this context? The brochure acknowledges that uncertainty exists within the field of climate science and that not all scientists believe in anthropogenic climate change. However, input of scientific experts remained limited to the brochure. During the actual discussion no climate scientists were present to answer questions or exchange ideas with. In the context of a one day event the relationship between experts and lay people was confined to one-way traffic. Expert controversy was added to the meeting after the deliberation: after all discussions were finished and all votes counted the citizens were treated to 'entertainment' during dinner: six experts, such as climatologists, climate-sceptics, and representatives of NGOs such as the World Wide Fund for Nature had a kerfuffle about climate policy.

The confrontation with different points of view is a valuable aspect of public debate, but also having to justify one's own point of view to others. The latter could have been emphasised more. A reason for this lack of what deliberative democrats call cross-cutting exposure could be that the set-up of a *deliberative*

poll was chosen. There are advantages to this model: a larger group of citizens can participate than in, for example, a consensus conference. Also, because preferences are voted for anonymously, group pressure or groupthink are avoided. A disadvantage is that participants are not stimulated to reach a solution together and this excludes finding alternatives or making compromises. As said before, a disadvantage of this model is also that there is less need to justify one's point of view to others. At least at the table one of us moderated, the discussion primarily consisted of a polite exchange of viewpoints and the arguments were not pulled onto a higher level. In other words, it is doubtful whether decisions were really reached on the basis of the force of the better argument, as Habermas envisaged.

On the other hand, his criterion of forceless force was fulfilled. All participants clearly had the same interest in clear climate policy and power differences were not discerned. Everyone had their say and people were not held back by status differences. One cause is probably, again, the set-up of the deliberative poll, where discussions take place in small groups and are intensively led by a moderator.

The day was divided in a number of components, each with a specific policy question. While these questions gave direction to the discussion, one can wonder whether such specific questions do not leave out relevant considerations that citizens might have. Not only the questions, but also the response options were highly prestructured and left little to the imagination. All this was done to create similar discussion arenas in the different countries and to make the results between the different countries comparable. However, the structuring raises questions about the inclusivity of the exercise. If we consider the results of the voting it appears that participants support far-reaching measures to counter climate change. For example, a large majority wants to limit the temperature increase to 2 degrees Celsius or less and are willing to pay more for their fuel to achieve this. Also, most participants support heavy sanctions on countries that do not reach their targets (http://www.rathenau.nl/publicaties/resultaten-wereldwijd-klimaatforum.html). One can wonder whether these results are surprising; could it have been different in this pre-structured set-up.

Despite the critical views of citizens, the climate negotiators did not appear to take the public view seriously during COP15. This is a common problem of citizen participation; governors can cherry pick or interpret results favourable to their own cause. And if this is not possible, they can always question the representativeness of the results: We now know the opinion of 94 citizens, but is this really a reflection of the rest of the Netherlands? This raises the question to what extent others than these 94 people were reached. The debate was characterised by a lack of media attention. A few radio-interviews were held, but no cameras were detected and newspapers did not give much attention to the debate.

Conclusion

In this paper we have aimed to show that climate change policy should be the subject of public debate, because it is an instance of a so-called unstructured problem. Unstructured problems cannot simply be solved by scientific experts or by bureaucrats, but they need to be deliberated by the broader public. We are pleased that in September 2009 a public debate was organised about climate policy. This debate – *World Wide Views* – was spectacular, because of its large and international character. In order to benefit even more from such debates in the future it is necessary to critically evaluate this debate. We have done so with the help of three overarching criteria: the debate should be open-ended and inclusive, and should be led by power differences as little as possible. We have argued that in some respects this can be called a successful debate, but that in other respects it could be improved. The fact that lay people had a say at all, and on such large scale, is an important step forwards. Also, the fact that power differences hardly seemed to play a role in the discussions – at least between the Dutch participants – is positive. However, we signalled a few problems as well.

The criterion of open-endedness was – at least until now – not fulfilled. It is unclear whether a sequel will be organised and it seems that the influence on actual policy was minimal. The criterion of inclusivity was only partially met. Lay people were given a voice and marginalised groups were represented. However, the debate was quite pre-structured, which means that perhaps not all relevant considerations were debated. Moreover, the interaction between lay people and 'experts' was minimal and it was determined beforehand who were experts, disregarding the fact that the lay-expert division is disputed in the case of unstructured problems. Due to the absence of experts during the discussions the communication had the character of one-way traffic and so-called experts could not learn from the input of lay people. Open expert-controversy was planned only at the end of the day as the icing on the cake. Moreover, the debate could have been more inclusive if more media-attention had been generated. The criterion of absence of power differences was met, although in practice it is doubtful whether the best argument has conquered.

Because of these critical remarks one can wonder whether the appropriate debate form was used to reach the intended goal. The aim of deliberative polls is in the first place to inform a large group of lay people and helping them reach a well-founded personal decision. Another important goal of deliberative polls is informing governors and experts about the opinion of lay people. These appeared to be the most important goals of *World Wide Views* as well and in that sense the right debate form was chosen. However, from our evaluation it becomes clear that the first goal was achieved better than the second one. If one directly wants to influence governors this debate form may be too undetermined.

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The truth is that we have an inconvenient nature

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Abstract

Climate change is expected to have a huge impact on food security. The debate about the role technology can have to mitigate the effects of climate change is in our view hampered by an a-historical and dualistic view on nature and the natural. Using the movie 'An inconvenient truth' as an example, we see parallels with the debate about genetic modification. In both debates nature and naturalness are categories that are placed opposite categories such as technological, cultural and the human. We come to the conclusion that in order to move forward, also when it concerns climate change, a different, dynamic, and multi-facetted understanding of nature is needed in societal debate. We also believe that there is a scale possible to measure the relative representation of these aspects. The approach we propose intends to replace nature and wilderness as references to one specific and static binary with a triangulated relation that integrates the multiple aspects of nature. This provides an approach that can enable stakeholders to arrive at a standard for nature that is dynamic, doing justice to basic ethical concerns.

Keywords: nature, biotechnology, dualism

Introduction

It has been a warm year again (NOAA, 2011) and it wasn't only this year that was warm. Over the last decades the global temperatures are rising and many worry that climate change will have detrimental effects for agricultural production. The world population is ever increasing and universal food security is still far from being reached. Since the 1960s global agricultural output has multiplied though, and the yield per hectare of the most important crops has almost doubled or more than doubled. With growth and an industrial -largely fossil fuel dependent- agriculture however, many increasingly problematical side effects have appeared as well. Agriculture itself now contributes to climate change and a degradation of natural resources. Deforestation and the use of fertilisers contribute to greenhouse gas build up. Agriculture forms a threat to biodiversity, occupies most of our arable land, is increasingly vulnerable to diseases and uses up water resources (IAASTD, 2009). As a result, the (green revolution) goals of increased productivity and economic efficiency are slowly shifting towards sustainable growth and mitigation of the negative consequences for the environment (Smith, 2000). Life-scientists like to promote innovations in biotechnology, like genomics based crop enhancement, as possible ways to counteract climate change and the food security consequences of this climate change. Others, conservation oriented actors, rather put the emphasis on restoring the 'natural' balance and tend to distrust a so called 'technological fix'. The contrast between these two approaches corresponds with ideologies related to the modern, dualistic understanding of nature that we possess. This understanding divides our world-environment in dichotomies such as nature-culture, nature-technology or nature and human(ity). This paper is aiming to point out that this dualistic thinking leads us to a stalemate in policy setting, as was the case in the controversy about genetically modified crops, where the same oppositions played such a role in the given arguments (Van Haperen *et al*., 2011). Therefore, we come to the conclusion that in order to move forward, a different, dynamic, and multi-facetted understanding of nature is needed in the discussion about climate change as well.

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An inconvenient truth

Nothing did put climate change more under the attention of the public eye than the movie 'An Inconvenient Truth' (West, 2006), presented and narrated by Al Gore. When we start watching An Inconvenient Truth, we are immediately presented with the two 'facts' about nature that set the tone for the rest of the movie. The first follows a shot of an idyllic and romanticized river scene with a voice-over telling us how Al Gore rediscovered how good nature feels, how beautiful it is and how nature is too much of a treasure to risk its destruction. The message here is: No one can deny the 'fact' that nature is good and is to be valued. Not only for our own sake but also intrinsically, for nature itself. The second fact is presented in a shot that immediately makes clear that when we watch this movie, we cannot do it any longer from a local or even only-human perspective. Seeing Earth from space, pulsing and shifting, shows us that the planet is a wonderful living thing and that it is a system with a fragile balance. What is presented here, is that there is a natural existence outside of our cultural understanding that functions autonomously in a precarious equilibrium that took billions of years to develop, and that we are about to destroy it in mere decades if we do not respect its workings. We are witnessing now, according to the film, 'a collision between our culture and the earth'. As climate change is widely believed to be human induced, it is suggested, that since our use of technology caused it we should also be able to remedy it with technology if only we change our culture accordingly. In the movie it is simply stated that we have all the technological means to turn the tide and reduce greenhouse gas emissions sufficiently to stop the warming up of the planet. What lacks, it says, is the political (cultural) will to do it. No matter how much it might be appealing for Al Gore, to broadcast the message that what we are dealing with here is a collision between our culture and the earth, it is slightly misrepresenting the issue as well. The romantic river images that are shown and the tranquility that is suggested to represent the earth, are not the same thing as our environment without greenhouse gasses or global heating. Also without greenhouse gas emissions cities and industries remain, representing another reality than the idyllic rural world. 'An inconvenient truth' eventually falls back on nothing more than a static non-critical romantic concept of nature represented by anti-urban and anti-industrial images of rural landscapes, to get the suggested solution of a 'clean technology' across. In the real world however, as is the case with debates about biotechnology in agriculture, there is much more doubt over the right methods and the right measures to implement climate change mitigation technologies and policies (Lomborg, 2001). There doesn't seem to be an easy way to find a balance between the ecological damage done by fossil fuel-based technology and the need for fuel-driven technology in order to achieve the appropriate growth that can meet the demands of a forever increasing global population and economy.

Wilderness and nature, technology and culture

In 'An Inconvenient Truth', nature and the wild as a concept are embodying the very thing they are supposed to deny: human interference. Nowadays, in order to 'give back nature its place in the world', all sorts of things are created, manipulated and labored. Natural parks and preserves are regulated, managed and maintained with one thing in mind: that they look like being untouched and pristine. In virtually all of its manifestations, our concept of nature represents a flight from history. 'Wilderness has become the natural antithesis of an unnatural civilization; The illusion that we can wipe out the slate of our past' (Cronon, 1995). With climate change being a consequence of us burning fossil fuels, it is undeniable that our impact on the environment is ubiquitous. The notion we once possibly had about a still existing wilderness, the presence of parts of pristine nature, untouched by human culture, has now gone forever. This a-historical nature is an epistemological myth that needs to be addressed. The planet heats up everywhere and not only where we live. Thus, the very idea of a place wild and untouched by man can now, in an absolute way, no longer be upheld (McKibben, 2005). The disappearance of true wilderness is not without implications. It is in the 'wild', in nature itself, that we seem to find everything worth keeping. In the wild, the ecosystem is thought to be in balance, and within this balance we find

all the raw natural resources we need to provide us (through technology) with the products we need to live our cultured lives (Cronon, 1995). But, as Cronon deftly points out, there seems to be a paradox here. And this paradox neatly fits with the myth of 'wilderness'. The value of natural resources, indeed nature, becomes apparent only in so far as we can attach meaning and purpose to those resources, which we do through cultural and technological action. We value that what we need and what we can exploit, if only to enjoy it while walking through. Recreating 'nature' with technological means though, seems a contradiction in terms. After all, from the previous perspective follows that where we are, nature is not, and where nature is, we should not be. In Deep Ecology the view is even brought forward that more or less all use of technology is disruptive and potentially robs humanity of essential resources by destroying the natural balance. This dualism between human presence and no human presence, prevents us from getting a clear sight on what the ethical, workable and sustainable human place in 'nature' can be. But then, in order to responsibly tap into natural resources, to ensure a sustainable way of life, what can our approach be? It cannot be the position taken within Deep Ecology, when it claims that the very start of agriculture has also marked the beginning of the disruptive violation of nature. A complete withdrawal is no option. What is nature to us when we cannot make use of it? Even though, 'An Inconvenient Truth' is hardly anti-technological in its approach, it leans upon this same dualism, when we are presented with the almost religious serenity of the pristine landscape, unscathed by greenhouse gas induced climate change. Cronon (1995) sees the presentation of these 'natural' images as a denial of history. Being environmentally friendly in our technology, does not really make it possible to reinstate unscathed pre-industrial nature and/or wilderness. This would simply come down to a denial of history. This denial is not coincidentally the strongest in people who are the farthest removed from the daily laboring of the land. It is the alienation from nature that gives rise to the idealization of it. The origin of environmentalism is urban, not rural (Lemaire, 1970; Weiner, 1992). Thus the resulting image of a tamed, benevolent wilderness, which is both our cradle and our future, embodies the dualistic vision in which culture and technology are ultimately placed entirely outside of the natural but nevertheless shape the images of a nature that can be enjoyed and exploited.

Seeing our blue planet from the sky as we do in Al Gore's movie ethical also has an ethical implication. Whatever the perspective we use, with entering space-age, the global ecosystem is now understood as a complex organic-like system that should remain in balance, with or without technological assistance. With this perspective the idea has also arrived that there are limits to the disturbance we can induce to that system (IAASTD, 2009; Lovelock, 2000). Not safeguarding the global equilibrium is a deontological mistake. There is thus an acute awareness that a technological fix could mean further intervention in a system, already out of balance. An awareness that we need to handle with care and maintain boundaries to what and at which speed we, as technological humans, allow ourselves to affect this system. Can it be responsible to put technology to work to reach sustainable levels of modern life? Technology is about optimization and seems to belong to a linear way of thinking, sustainability aims to make processes cyclical and aims at an equilibrium (Karafyllis, 2003). Questions about nature and how it functions and what it aims at, are at the heart of debates about biotechnology and sustainability. We nowadays can come across the idea of geo-engineering as a way to preserve a balance in the global ecosystem and remedy climate change. Geo engineering is presented as a mimicking of the kind of climate control we find in nature by letting the environment absorb or emit substances that are short or in excess. The outburst of Mount Pinatubo in the Philippines had a global cooling down effect as the ash clouds reduced the amount of solar heat reaching earth. Inspired by this example, engineers are now working on techniques to disperse minerals in strategic places to induce the uptake of greenhouse gasses (Trenberth and Dai, 2007). This idea to mimic nature with technological means, resembles the idea that genetic modification in plants can be regarded as a natural process, as it is no more than imitating the working of the agrobacterium tumefasciens (Van Wordragen And Dons, 1992). It's also no less controversial. This is why the Royal Society has started a public debate on the ethical boundaries of Geo-engineering (The Royal Society, 2009). To what extent these approaches can indeed cross-pollinate

with ideas of preservation and restoration and whether technology can become an appropriate means to reach sustainability, seems to stand or fall with the assumptions made about how nature itself can reach optimized states, and to what extent this state would be enhanced or hampered again by our technological interferences. Starting from the dualistic image of nature, climate change thus seems to pose us with the problem how we possibly can use technology to remedy a nature thrown out of balance by means of, again, technology. If culture is completely technology dependent and if, as said in the movie, there is a collision between our culture and earth, it should follow that there is a collision between technology and earth as well. How then would technology possibly offer a way out of this collision? Binary understanding, the opposition of technology and nature, culture and nature, indeed human and nature, will trouble us in setting the right mitigation policies and developing sustainable ways of production, because it is impossible to make a choice between nature and technology, when it is technology and our technological ontology that shape our images of nature.

Away from dualism

Climate change is not only about controlling the atmosphere. What should interest us, is to what extent the issue of global heating is significant in relation to our life-world (Lomborg, 2001). Climate change has put nature center stage once more. The debates provide us with new questions about our natural and social worlds. How we deal with climate change is directly linked to how we (re)produce the world symbolically and materially. Elaborating how nature is construed should help us to better appreciate the diversity of the different 'natures' and 'environments' that we carry around in our heads while discussing our policies and institutional structures. To accomplish this, we must emphasize that the epistemology of nature shifts in dimension and meaning, together with the life-world that we know and together with the changing (technological) environment we live in (Soper, 1995; Weiner, 1992). No need to stress that there is a political dimension as well. We must avoid however, to let nature become merely a cultural categorization if we don't want the environmental problems, which are very real, become mere subjective interpretations too. So where, on the one hand, we need to create the understanding that a social construction is present in our images of nature and the environment, we must on the other hand make clear, that we keep the agency of nature central, in order to provide us with the deontological handles to solve environmental problems in an ethical way (Eden, 2001). 'Nature' is not only a concept that signifies the separation of our cultural and technological selves from the natural, but it can simultaneously function as a standard (if something is against nature, it is not right) that sets boundaries to human intervention and disruption too.

In the public debates about Genetic Modification in agriculture (GM) which we discussed in a previous article, nature was also put in opposition to other core categories such as culture, human disruption, technology, management, and so on (Van Haperen *et al*., 2011). These oppositions proved to remain problematic, because they left little room for negotiation when something simply is or is not accepted because it is deemed 'natural'. The public debate on climate change in our view risks the same fate if the used concepts of nature and wilderness remain a dualistic, closed and static reference for our thinking. As nature is at the center of the issue of climate change, we believe that a similar concept as proposed for the GM debate can be used to avoid dualistic pitfalls. In this concept, in analogy with Williams (Williams, 1983), we consider technology (exploiting and working the material world), culture (attributing qualities to objects and symbols) and ecology (understanding and using the -global- system and its workings) as the most important aspects that compose our image of nature. Other than Williams, however, we maintain that all three of these aspects are always present in every interpretation of nature and that they affect each other when changes take place. Through production, the symbolic value of resources changes, through belief systems, the value of production changes, and through a changing environment, the believe and production systems alter again. For example: an important issue with climate change debates is control and organization. Climate change discussions are not only linked to reduction of

greenhouse gas emissions and mitigating effects of climate change, but are also about responsibilities and control over resources and means of production. The cultural and ecological perspectives we have concerning nature are important parameters to decide what are ethical and responsible ways to put nature to good use in our production schemes. This can be clearly seen when the Inter-governmental Panel on Climate Change (IPCC), formed by the World Meteorological Organization (WMO) and the United Nations Development Program (UNDP), are putting the millennium development goals on their agendas (IPCC, 2007). It is also clear that the nations that contribute most to the greenhouse gas emissions are the most developed nations, and that the consequences of the global warming could be felt most by the less developed countries. The most developed nations are also the tech-savvy nations that have the possibilities to work on sustainable technologies. In addition, the global negotiations about reducing greenhouse gas emissions favor the agendas of the more powerful nations (Hertwich and Peters, 2009). Hence, it is clear that power and control over climate affecting technologies are in the hands of the wealthiest nations and that a fair distribution of wealth and resources is in the climate change debate as much an issue as it is in the debates about gen-technology in agriculture. In public debate and from an ethical perspective, what needs to be re-arranged when each of these (ecological, cultural and technological) aspects change, is the relative importance of them vis-à-vis each other.

Our position is that if one or two of these aspects of nature are underrepresented in our dealings with the environment, this is for most of the world not acceptable. We also believe that it is possible to construct a scale to measure the relative representation of these aspects. Siipi presents us with sets of comparative relations forming gradient scales that express whether something can be considered to be more natural than something else. Summarized we can discriminate three relations: (1) something is more or less subjected to human interference/disruption; (2) something is more or less fitting images of normality and biological/genetic-based action; (3) something is more or less in accordance with human nature/purpose (Siipi, 2008). Scientists and policymakers are increasingly convinced that technological innovations need to be accompanied by a dialogue between science and society which is true to the context and content of the developments. It is thereby important not to ignore the results of previous dialogues and consultations and to come to an integrative approach (Goven, 2006). The approach we propose intends to replace nature and wilderness as references to one specific and static binary with a triangulated relation that integrates the multiple aspects of nature. This provides an approach that can enable stakeholders to arrive at a standard for nature that is dynamic, doing justice to basic ethical concerns.

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Section 4. Ethics, adaptation & mitigation

A climate tax on meat?

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Abstract

The livestock sector contributes substantially to global warming. In addition to technological measures, an option for lowering the greenhouse gas (GHG) emissions from this sector could be to reduce meat production. A way of influencing production in this direction is to reduce consumption. However, voluntary changes in lifestyle would probably not be sufficient. Too few people would be prepared to do this for these changes to make a real difference. General changes in lifestyle in the population would rather require coercive measures, for example in terms of a meat tax. In this paper, I investigate the pros and cons of a climate tax on meat. In particular, I discuss whether the tax should be GHG weighted or not, given the much higher GHG intensity of ruminant meat (beef and sheep meat) compared to pork and chicken meat. I suggest that we introduce a GHG weighted tax within the EU with a higher tax on consumption of beef and sheep meat than on consumption of pork and chicken meat. However, if necessary for successful mitigation of climate change, I do not exclude that the tax could in a second step be turned into a non-GHG weighted tax, stimulating people to be more radical and eat even less meat.

Keywords: consumption, lifestyle, livestock, meat tax

Livestock production contributes to climate change

The livestock sector contributes to global warming, although there is some disagreement on exactly how much (cf. Herrero *et al*., 2010). Moreover, its relative contribution compared to other sectors like energy, industry and transport varies strongly from one country to another (Pitesky *et al*., 2009).

Given that the contribution to climate change of the livestock sector is substantial, and given that we have an obligation to mitigate climate change for the benefit of future generations, what should be done? I have investigated various options elsewhere (Nordgren, 2011a,b). In this paper, I focus specifically on the option of a climate tax on meat consumption.

Mitigation measures

One approach to mitigation of climate change is technological. The GHG emissions are to be reduced by improving the methods of production. Regarding beef production, one measure could be to improve productivity. By changing to a more concentrated diet or by genetic selection the cattle will grow faster and thereby emit less GHGs over lifetime. Many other options have also been suggested, for example the use of manure for production of biogas (Garnett, 2009).

This is not the place to discuss these technological options or assess whether they are sufficient. I will simply assume that they are not sufficient and focus on another type of mitigation approach that has been suggested in the debate, namely reduction of meat production and consumption (see, for example, Garnett, 2009; Audsley *et al*., 2009; Stehfest *et al*., 2009; Wirsenius *et al*., 2011).

A key argument in favor of this approach focuses on the differences in GHG intensity of various food products, as shown by various reports based on life cycle analysis (see, for example, Williams *et al*., 2006; Cederberg *et al*., 2009; Audsley *et al*., 2009). For instance, in the UK report by the World Wildlife Fund and the Food Climate Research Network, the GHG intensity of beef is estimated to be 12.14 kg CO_2e/kg,

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of sheep and goat meat 14.61, of pork 4.45, and of chicken meat 2.84. If we turn to non-animal food products, we find, for example, that the GHG intensity of wheat (milling) is 0.52 CO_2e/kg, of potatoes 0.26 kg, and of apples 0.32 (Audsley *et al*., 2009: 37-39). So, the GHG intensities of animal products are generally much higher than those of non-animal food products, and among animal products the GHG intensities of beef and sheep meat are much higher than the GHG intensity of pork, which is higher than the GHG intensity of chicken meat. These differences in GHG intensity could be used a basis for changes in diet with a high mitigation potential, as the UN Food and Agricultural Organization (FAO) states: 'Shifting consumption from animal products with high associated GHG emissions (beef and sheep meat) to products with lower emissions (poultry, vegetable protein) can reduce total global GHG emissions' (FAO, 2009: 74).

Given that we should mitigate climate change not only by undertaking technological measures but also by reducing meat production and consumption, the question arises how to do this in practice. One option among others is a climate tax on meat consumption. However, in order to have any substantial effect on global warming – and focusing on what could be done in Europe – such a tax has to be a common EU tax. A meat tax in a single European country or a few European countries would make no real difference. With this in mind, let us turn to the pros and cons of a meat tax within the EU.

Pros and cons of a meat tax within the EU

Pros

1. General changes in lifestyle in the population would probably require coercive measures. To try to reduce meat consumption by means of voluntary changes in lifestyle would probably not be sufficient. Too few people would be prepared to do this for these changes to make a real difference (cf. Alcott, 2008). A reason for this is that the problem of mitigation of climate change is a collective dilemma, as pointed out by Stephen Gardiner. It is a situation in which it is collectively rational to cooperate and mitigate climate change by reducing the emissions of GHGs – since this would lead to a better future world – but individually rational not to mitigate climate change by reducing one's own greenhouse gas emissions – since each individual's emissions are insignificant and mitigation would be too costly for the individual (Gardiner, 2006). This dilemma is of a type that Hardin calls 'The Tragedy of the Commons' (Hardin 1968). Now, Gardiner stresses that '... the appropriate means for resolving commons problems... is for the parties to agree to change the existing incentive structure through the introduction of a system of enforceable sanctions (Hardin calls this "mutual coercion, mutually agreed upon")' (Gardiner, 2006). By political steering, the rules of the game may be changed in a way that what is collectively rational would also be considered rational to the individual. Applied to mitigation of climate change – to the extent it is caused by meat production – an appropriate coercive measure to reduce consumption of meat, and thereby production of meat, could be a consumption tax on meat.
2. Every product on the market should bear its own climate costs. This includes food products and, by implication, meat. This argument could be based on a kind of proportional principle of emissions justice. However, the focus should be on consumption rather than production due to the high monitoring costs of production. In consumption, on the other hand, a reasonable average should be possible to agree upon (cf. Wirsenius *et al*., 2011; see further below).
3. A EU tax on meat consumption would have substantial mitigation effects. People will on average eat less meat. To date, the most developed argument for such a tax has been provided by Wirsenius *et al*. In their economic calculations, they show that a meat consumption tax can be cost-effective within the EU. It would have even more substantial mitigation effects if it is combined with using former grazing land for bioenergy production (Wirsenius *et al*., 2011).
4. We could think of a meat tax as a tax comparable to taxes on alcohol and tobacco. Such taxes have obviously been possible to implement in many countries. It is quite likely that when the general

public starts to accept that global warming is dangerous they may also accept a substantial tax on meat consumption. Once implemented, it will become part of everyday life like any other consumption tax and can rather easily be increased from an initially low level (cf. Oreskes, 2011 on carbon taxes).

Cons

1. In mitigation of climate change, we should not focus on the livestock sector but on other sectors, for example transport and energy.
   a. One reason is that the GHG emissions in this sector in many developed countries are lower than in, for example, the transport sector. In most developed countries the contribution of livestock production is relatively small compared to the transport and energy sectors, while it can be much higher in developing countries, because of their much smaller transport and energy sectors. In the US, the livestock sector contributes only 3%, while the transport sector contributes 26%. In a developing country like Paraguay, the livestock sector may contribute more than 50% because of the much smaller transport and energy sectors (Pitesky *et al*., 2009). On this basis one could argue that the US and many other developed countries should undertake mitigation measures primarily in the transport sector because this sector emits relatively much more GHGs than the livestock sector.
   b. Another reason for not focusing on the livestock sector is that it is more difficult to undertake mitigation measures in this sector than in, for example, the transport sector. In particular, it is more difficult to reduce the GHG emissions by taxes on meat consumption than by new transport and energy technologies.
2. We can expect that important groups in society will oppose a meat tax, or at least be very reluctant, making it unfeasible. Meat producers and their organizations will oppose the option of reducing meat consumption, and thereby production, by a meat tax. Meat production represents vital economic interests and job opportunities. A meat tax will also be opposed by many politicians. They may have supported their own country's farmers for a long time, and this would make it difficult for them to support reduced meat production and consumption as a climate change mitigation measure. More fundamentally, food consumption is a sensitive area, closely related to lifestyle, and politicians may be reluctant to steer people's lifestyle in a particular direction. This brings us to the reluctance of many meat consumers. This reluctance is due to deeply rooted consumption habits. The desire for meat is very difficult for many people to overcome. In addition, lifestyle and diet might be experienced as something that politicians should not interfere with. To do so would be a violation of basic values such as individual autonomy and privacy.
3. If meat consumption in EU countries is reduced by an EU consumption tax on meat, this would lower global meat prices and lead to higher meat consumption in non-EU countries. Subsequently, the global GHG emissions may not decrease.

Responses to the con arguments

To 1a: A response to the argument that the GHG emissions in the livestock sector in most developed countries are lower than in, for example, the transport sector is that the issue of mitigation of climate change is so urgent that all sectors should contribute, including the livestock sector. Even if the relative emissions from transport are higher than those from livestock in many developed countries, as in the US, the absolute emissions from livestock are still substantial. This is indicated by the fact that the total production of meat in the US (with a relatively small contribution by livestock compared to transport) is 42 million tonnes per year, while it is only 0.6 million tonnes per year in Paraguay (with a relatively large contribution by the livestock sector) (FAO, 2012a (these figures concern the year 2010)). And if we focus on consumption rather than production, the dimension of the problem is underlined by the fact that the US has the highest per capita consumption of meat in the world, 123 kg per year, compared

with India, which has the lowest consumption with 3 kg, and compared with the average consumption in the world with 40 kg (FAO, 2012b (these figures concern the year 2007)).

To 1b: A response to the argument that sufficient technological solutions are difficult to develop in the livestock sector is that even if this would be true – and it seems to be true – this does not mean that no mitigation measures can be undertaken in this sector whatsoever. We could still try to lower the GHG emissions by means of a climate tax on meat consumption.

To 2: A response to the objection of unfeasibility is that the opposition or reluctance among some groups in society can be handled or that we at least should try to handle it. A focus on consumption may be more feasible than a focus on production, since meat consumers are likely to change their average diet due to a consumption tax on meat, while meat producers are not as likely to give up their enterprise as easily. Many politicians would certainly be reluctant to introduce a consumption tax on meat because of previous commitments to the livestock industry and out of respect for individual autonomy and privacy, but they could still be put under pressure by voters.

To 3: What this objection shows is that reduction of meat consumption and reduction of meat production must go hand in hand and that this must occur at a global level. In order to have an effect on the global emissions in the long run, an EU consumption tax initiative must be followed by other developed parts of the world.

A differentiated or a non-differentiated meat tax within the EU?

Given the advantages of a tax on meat consumption, should this tax be differentiated or non-differentiated, or put more precisely, should it be GHG weighted or not? Wirsenius *et al*. argue in favor of a climate tax that is weighted according to the average GHG intensities of different animal food products (see above). In their example, the tax on ruminant meat is 16%, on pork 5%, and on poultry meat 4% (Wirsenius *et al*., 2011).

Pro a GHG weighted meat tax

1. One argument is that the GHG intensity of beef and sheep meat is much higher than the GHG intensities of pork and chicken meat, and that this difference should be exploited in taxation. In their calculations, Wirsenius *et al*. show that 80% of the effect of a meat tax can be obtained by taxing the consumption of beef and sheep meat alone (Wirsenius *et al*., 2011).
2. As pointed out above, every product should bear its climate costs, including animal food products. This 'emissions justice' gives us a reason to have a differentiated meat tax because different kinds of meat emit different amounts of GHGs.
3. Another argument in favour of a GHG weighted tax is that it is likely to change the average diet. People would buy relatively less of food products with a higher tax and relatively more of the food products with a lower tax (cf. Wirsenius *et al*., 2011).

Con a GHG weighted meat tax

1. One objection to a GHG weigthed meat tax stresses the complexity of the issue and points out that cattle under certain circumstances can contribute to mitigation of climate change. If cattle graze on wild grasslands without concentrated feed, their role in carbon storing may compensate their emissions of methane and nitrous oxide (Allard *et al*., 2007).
2. Another objection is that a weighted tax would stimulate production of pork and chicken meat and this would have certain bad consequences. Pigs and chickens eat cereals, but so could humans, and this would be much more resource efficient than eating pork and chicken meat. Pigs and chickens

are also fed with oilseed (soy), and much current production of oilseed implies high carbon dioxide emissions due to deforestation (mainly in Latin America) (Garnett, 2009).

3. Finally, a tax that stimulates production of chicken meat is negative from the perspective of animal welfare, because of the low welfare of massproduced chickens (cf. Morris 2009) compared to the somewhat better welfare of cattle grazing outdoors. A non-differentiated tax on meat would therefore be preferable (Singer, 2009).

Responses to the con arguments

To 1: A reply to the objection that cattle can play a positive role in mitigation of climate change is that the circumstances for this are rare in many countries and would allow only a much lower number of cattle than is currently the case.

To 2: A reply to the objection that humans could eat the cereals and that production of soy is negative for the climate is to take this is a reason to have a GHG weighted tax only as a starting-point and after a certain period of time turn it into a non-weighted one that would cover all kinds of meat equally and that would thereby stimulate people to eat even less meat.

To 3: A reply to this last objection about animal welfare is that what it shows is rather that a differentiated consumption tax must be combined with efforts to improve the welfare of chickens.

Conclusion

I conclude that we should implement a consumption tax on meat within the EU and that this climate tax should be GHG weighted. The main reason is that we could obtain a very substantial mitigation effect even by taxing ruminant meat alone and this circumstance should be exploited. In addition, a GHG weighted tax would probably easier get acceptance among the general public than a non-weighted tax and be a first incentive to start changing the consumption patterns. However, if necessary for successful climate change mitigation, I do not exclude that the GHG weighted tax could in a second step be turned into a non-weighted tax, putting stronger pressure on people to eat less meat more generally.

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Acting now or later? Determining an adequate decision strategy for mitigation measures addressing methane emissions from ruminants

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Abstract

Nutritive options for ruminants, which have been proposed to mitigate methane (CH_4) emissions, are used to showcase how decision strategies enable reasonable decision-making in case of various types of uncertainty of information regarding the policy decision problem. Decision strategies concerning the scope of the decision problem and the timing of decision-making provide a systematic structure for deliberation and learning about these types of uncertainty. Regarding nutritive options for ruminants, incompleteness, inherent variability, and unreliability of information about the options, outcomes and stakes involved speak against accepting the proposed list of options and closure of the decision problem. However, the role of CH_4 emissions from ruminants in abating global warming speaks against passive postponement of decision-making. Thus, decision strategies to be considered are adapting the list of options and active postponement, or possibly semi-closure, of decision-making.

Keywords: uncertainties, decision making, timing strategy

Introduction

Often, policy options cannot be ranked according to the values of their outcomes as a basis for rational decision because of uncertainties. If this is the case, decision strategies provide an alternative to simply 'muddling through' or abandoning decision-making altogether. In this paper, nutritive options to reduce CH_4 emissions from ruminants are used to showcase how decision strategies enhance deliberation and learning in the decision-making process.

Methane is the second most important long-lived greenhouse gas (GHG) after CO_2 (Forster *et al*., 2007), with ruminants accounting for about 28% of all anthropogenic CH_4 emissions (Beauchemin *et al*., 2008). In view of the strong reductions in global GHG emissions required to keep the global temperature increase below 2 °C, reducing CH_4 emissions from animal livestock husbandry would be an important contribution to the mitigation of global warming.

Our study focuses on nutritive technologies to reduce CH_4 emissions from ruminants in Europe without affecting the production level (Smith *et al*., 2007, UNFCCC, 2008), including two options for diet composition (concentrate rich diets/low roughage diet; increase in dietary fat/lipid), one for feed plants (legumes), one for feed quality (improve forage quality: low fiber/high sugar), and two for extract supplementation (tannins/saponins). Possible outcomes considered by UNFCCC (2008) include the mitigation potential of the respective nutritive option, economic effects such as production level, cost for diets, etc., environmental effects focusing on GHGs which cannot be mitigated, as well as effects on animal health and welfare, such as toxicity. We point out the various types of uncertainties by summarizing information from UNFCCC (2008) on a general and qualitative level without further specifications between options.

In section 2, we identify nine types of uncertainties to be considered in decision strategies, and we discuss whether the information on nutritive options for ruminants is associated with these uncertainties.

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In section 3, we distinguish between six decision strategies which may be used to determine the scope and timing for decision-making. We discuss which of these strategies can(not) account for uncertainties of information in our showcase.

Types of uncertainty

Uncertainties of policy decision problems

In decision theory, 'decision under uncertainty' refers to decisions in which the probability of the possible outcomes is either completely unknown or known with insufficient precision (Luce and Raiffa, 1957). At the same time, it is assumed that all other relevant features are well-defined and known, specifically, the set of options, the possible outcomes of each option, and the value attributed to each possible outcome. In this paper, the term 'uncertainty' is used in a much broader sense, i.e. as an umbrella term for different types of uncertainty, following the usage found in policy analysis, integrated assessment and other fields of decision support. Although considered a major topic in decision support, typologies for characterizing uncertainties are typically too narrow as well as accompanied by puzzling terminology. To avoid confusion, there needs to be a more comprehensive and transparent typology of uncertainties.

We understand 'uncertainty' basically as a concept with two dimensions: 'location of uncertainty of information' ('location' for short) and 'source of uncertainty of information' ('source' for short). 'Location' relates to the question of which parts of the policy decision problem are associated with uncertainties. Location includes information about options, outcomes and values (Hansson, 1996). 'Source' refers to why uncertainties are associated with information concerning certain parts of a decision problem. Sources are incomplete information, inherent variability and unreliable information. In a companion paper (to be submitted), we show that this structure allows for the systematic combination of distinctions which can be found in the work from decision support, decision theory and value theory (e.g. Hansson, 1996; Sen, 1992; Sigel *et al*., 2010; Walker *et al*., 2003). The types of uncertainties related to a policy decision problem depend, to a considerable extent, on the framing of the policy decision problem. This includes ethical perspectives on the problem, scientific understanding of the processes in the natural and social systems, as well as judgments concerning the feasibility and effectiveness of various policies.

Sources of uncertainties related to information about options

In the framing of the policy decision problem regarding CH_4 emissions from ruminants, one core feature is that there be no decrease in production level. Within this framing, the list of options prima facie appears to be complete since measures such as increasing productivity or life-span of animals are either already in use or not allowed (e.g. antibiotics and vaccinations). However, nutritive policies to reduce CH_4 emissions promote morally problematic ways of treating animals (Singer and Mason, 2006), and they entail a morally questionable trade-off between using crops for the nutrition of animals or of humans, because increasing the level of consumption is the major driver of increase of water consumption (Oenema *et al*., 2005; Steinfeld *et al*., 2006). These are reasons to question the framing of the policy decision problem and to consider a framing which includes options such as changes in lifestyle and consumer behaviour. Thus, the information on the list of nutritive options appears unreliable. It is typical for debates on environmental policy issues that a problem framing is contested because it raises issues of incomplete or unreliable information on options.

Sources of uncertainties related to information about outcomes

Regarding outcomes, typically all three sources of uncertainties need to be considered: (1) incomplete information, which is due to the state of knowledge but, in principle, can be reduced; (2) inherent variability, which is assumed to be a feature of the kind of problem at hand; and (3) unreliable information, as it is not always sure whether methods are appropriate or views on the problem unbiased. Outcomes of nutritive options for ruminants which are taken into consideration by UNFCCC (2008) include intended effects on climate, such as abated GHG and mitigation potential, as well as side effects on the economy, environment and animal health/welfare. There is some information on the effects of first stomach intervention on animal welfare, as well as on the quality of products, human health (food chain) and the degree of permanent GHG reduction. However, there is a lack of information concerning the interaction of variables as well as any possible effects on landscapes, biodiversity and distributive justice. Of course, inherent variability of the affected systems might also play a role. Unreliability of information is typically indicated by major disagreement among experts. This has not been reported for nutritive options in UNFCCC (2008). Still, it is plausible to assume that there is a general public mistrust of experts due to a lack of information and public sensitivity to nutrition technologies.

Sources of uncertainties related to information about values

The term 'value' is used to refer to (1) positively or negatively valued effects (goods and damages, technically speaking: value-bearers); (2) the amount of value (technically speaking: measured merit) as attributed to the effects; and (3) reasons for valuing effects, such as economic, ecological and social reasons (technically speaking: standards). Information on value-bearers by UNFCCC (2008) is incomplete, since important effects of nutritive options are not included. The information on standards for valuation also seems incomplete, because effects on the environment and on animal health/welfare should be valued not only economically, but also for reasons such as ecological integrity, for being an existence value, distributive justice within and between generations, and others. Because merits are measured only by means of economic valuation, which has caused much disagreement among experts regarding the reliability and validity of methods (Ackerman and Heinzerling, 2004), information on merits of effects is unreliable. However, applying different standards as mentioned above would also be related to uncertainty, because merits on different standards are incomparable which is a case of inherent uncertainty. If one assumes that the merits of different effects on different standards do not compensate each other, the ranking of nutritive options must be incomplete. Thus, uncertain information from different sources on value-bearers, standards for valuation, and merits prohibit a ranking of nutritive options.

Decision strategies

Hansson (1996) has provided some fruitful ideas on decision strategies for coping with uncertainties related to a decision problem. However, thus far there has been no systematic analysis of decision strategies, criteria for choosing a decision strategy, or distinguishing decision strategies from other components of decision-making such as decision rules (e.g. maximim expected utility). A decision strategy is a systematic way of determining aspects of the decision problem and components of the decision-making process. In this paper, we focus on scope and timing of decision-making. The scope of the decision problem results from problem framing and determines a list of policy options. Strategies concerning the scope of the decision problem include accepting or adapting a proposed list of policy options. Regarding the timing of decisions, we will discuss closure and semi-closure of the decision problem, as well as active and passive postponement of decision-making. We provide a more detailed discussion on decision strategies in a companion paper (to be submitted).

Acceptance of a proposed list of policy options is a prerequisite for making a definite decision. If the proposed list of policy options is contested, the parties involved may reject the list, refrain from making a decision or from implementing it. The list of nutritive options provided by UNFCCC (2008) seems unreliable because of the questionable framing of the decision problem. Therefore, accepting this list is not an appropriate strategy.

The aim of adapting a proposed list of options is to account for different problem framings, for instance the framing as an efficiency problem (nutritive options) or as a sufficiency problem (options to change lifestyle and consumer behaviour). Coming to an agreement on policy options involves dealing with different views on substantial issues and takes time. Adapting a proposed list of options can proceed by determining intersecting parts of different problem framings, which are uncontested, or by changing the proposed list of options. Proposing to agree on deciding on the nutritive options as a subset related to an intersection of different problem framings assumes (1) that decisions on nutritive options are independent enough to prevent further misleading decisions; and (2) that the search for and decision on policy options which address consumer behaviour will then in fact be pursued.

'Closure of the decision problem' means that a definite decision on the basis of the available information on options, outcomes and values is made now, so that there is no further potential for deliberation and learning about uncertainties. Closure is not an appropriate strategy in the case of nutritive options for reducing CH_4 emissions from ruminants because adapting the list of options seems reasonable. Understanding the nutritive options as a subset of options which can be agreed on would require that uncertainties of outcomes and related values allow for closure of the subset, which is not the case.

Semi-closure refers to a provisory implementation of options not only in order to gain experience regarding outcomes and values of the options with the goal of improving them, but also to provide opportunities to reflect on problem framings and develop further types of options. Semi-closure presupposes reversibility of implementation, since reconsidering the decision problem could lead to a different decision later. This is feasible for the proposed nutritive options. However, if the best among the reversible options is significantly worse than the best among all options, this speaks against semi-closure. This is a question of how nutritive options compare to other types of options for reducing CH_4 emissions from ruminants. Unfortunately, there is not only a lack of comparative information but also of information regarding other criteria against semi-closure, such as the cost of searching for new options and the risk of eschewing the search for new options.

A third strategy, active postponement of decision-making, allows the decision problem to be kept open. There is no provisory implementation of options, but a commitment to actively searching for improved options and other types of options which may be adopted later. Such a moratorium provides opportunities to consider different problem framings and to reach an agreement on the list of policy options for decision-making. Further consideration may be given to assumptions regarding problem framings, information about options gained from ongoing searches, as well as the further development of the problem under current practice. However, several points speak against active postponement: the costly search for new options, unconducted searches, the severity of the problem, and problem escalation. Of course, these criteria are crucial not only when considering active postponement but also semi-closure and passive postponement (i.e. 'muddling through' and possibly running the risk of eschewing the decision problem). Thus, it is our goal to investigate these criteria with regard to nutritive options for ruminants in order to reduce CH_4 emissions.

Global climate change is a serious problem which endangers natural and human environments. The situation will escalate with time if no mitigation measures are taken. CH_4 is the second most important GHG after CO_2 in terms of radiative forcing (Forster *et al*., 2007) and at 14.3% also the

second largest source of global anthropogenic GHG emissions. In the absence of mitigation measures, global emissions from agriculture are projected to increase further due to expected increases in food demand and diet changes as the world's population continues to grow. Several mitigation options for reducing livestock-related GHG emissions via improved feeding practices, dietary additives or manure management have been proposed (Smith *et al*., 2007). The mitigation of non-CO_2 GHG emissions can be a relatively inexpensive supplement to CO_2-only mitigation strategies. Stern (2006) estimated the current social costs of carbon with a 'business as usual' trajectory to be around \$85/tCO_2. In view of livestock management in Europe, US-EPA (2006) estimated a potential reduction in GHG emissions of 13% at carbon prices of about \$30/tCO_2-eq and 17% at \$60/tCO_2-eq. Therefore, criteria such as the severity of the problem, the question of escalation over time, as well as the identification of feasible and reversible options which can substantially contribute to mitigating the problem clearly speak against passive postponement and continued 'business as usual'. On the other hand, uncertainties associated with all components of the decision problem as it is framed speak for adapting the proposed list of nutritive options and therefore against closure of the decision problem. The choice between active postponement and semi-closure on nutritive strategies depends on how uncertainties related to nutritive options, their drawbacks as well as the risk of misleading decisions, are judged.

Conclusion

As this paper has shown, there are more types of uncertainties of information related to policy decision problems and requiring consideration in decision-making than are typically dealt with in decision theory or policy analysis: uncertainties of different sources and of different location. In the case of nutritive options to reduce CH_4 emissions from ruminants, a questionable problem framing which includes the ethical perspective on the problem, the scientific understanding of the processes involved in the natural and social systems, as well as judgments on the feasibility and effectiveness of various policies leads to unreliable information on options. Therefore, it is crucial to reflect on the framing of the policy decision problem so as to disentangle and account for uncertainties in decision-making. Decision strategies contribute to reasonable decision-making in the face of uncertainties. Strategies to determine the scope and timing of decision-making keep part or all of the decision problem open, and they provide a structure for deliberation and learning. Adapting the list of options combined with either active postponement or semi-closure of decision-making are proposed as reasonable strategies for nutritive options to reduce CH_4 emissions from ruminants in Europe.

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Equal per capita entitlements to greenhouse gas emissions: a justice based-critique

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Abstract

Climate Change has made us aware of the finite absorptive capacity of the atmosphere. Moreover, a fifth of the emissions that overstep our earth's *boundaries* result from meat and dairy consumption, which is estimated to double by 2050. In this paper we question whether an equal per capita (EPC) allocation of emission entitlements, and Contraction and Convergence (C&C) approach that is derived from the EPC model, meets the demands of distributive and participatory justice. We first explain that the EPC ignores historical responsibility for the problem and prefers the use of a benchmark emissions year on the basis of which emissions are measured and entitlements are distributed. We argue that the use of a benchmark favours the largest culprits and harms the development of non-industrialized nations. Nevertheless, whilst advocating the inclusion of historical responsibility, we refrain from promoting negative allocations, for this would violate premises of egalitarian moral theory. Furthermore, the EPC model ignores existing geographical and interpersonal differences that seem to require a differentiated allocation, for it disregards the moral difference between subsistence and luxury emissions. It thus centres on the means instead of the ends of energy use. Moreover, we observe that the equal allocation proposal isolates goods, and argue that theories of justice relate to 'packages of goods', rather than to separate goods. Finally, we question whether the EPC scheme meets the requirements of participatory justice. The proponents of an equal allocation assume the state to be the aggregate rights bearer, yet in our view such an assumption implies certain potentially harmful generalisations. With regard to the responsibility-based efforts that nations should undertake, we propose to differentiate between groups within nations so as to enhance the participatory justice of bearing responsibility for the problem.

Keywords: distributive and participatory justice, contraction and convergence, meat and dairy emissions

Introduction

In view of the anthropogenic forcing of the earth's energy balance and the resulting climate change, direct action is desperately needed to avoid harming both the worst-off among the currently living and the future generations of the world. The limited absorptive capacity of the earth needs to be treated as a common good and allocated in an equitable manner. Therefore, principles of distributive and participatory justice need to be examined in order to obtain the most equitable distribution of emission entitlements that takes account of the differential, i.e. *unequal,* needs of people. However, for us to live in a sustainable manner the overall environmental impacts of human activities should be reduced significantly, even more so since the world population grows and the per capita consumption of meat and dairy products is set to double by 2050 (FAO, 2006). Since the latter production plays a crucial role in overstepping the *planetary boundaries* of biodiversity loss, nitrogen cycle disruption and carbon cycle disruption, and given that the meat industry is responsible for a fifth of global GHG emissions, we will need to redirect our food consumption in a world of 800 million malnourished and 1,6 billion overweight individuals (Aiking, 2010: 4; FAO, 2006; McMichael *et al*., 2007: 1253).

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Allocation of entitlements: EPC

Introduction

Starting from an egalitarian philosophy, many authors consider equal per capita entitlements (EPC) as the most equitable model to allocate emission entitlements, since, in their view, it represents the only way to overcome the climate change paradox: while the industrialized nations are responsible for the high levels of GHGs, the non-industrialized nations on the whole refuse to reduce their emissions even though they are already bound to be climate change's most prone victims (*inter alia*: Agarwal, 2002; Aslam, 2002; Bode, 2004; Grubb, 1989, 1995; Jamieson, 2010; Moellendorf, 2009; Singer, 2010). However, since it is estimated that the emission levels of the non-industrialized nations will top the rates of their northern counterparts in the third decade of this century, for a serious reduction effort to succeed, the non-industrialized nations cannot be allowed to emit *ad infinitum*. The proponents of the EPC model argue that it would promote the development of the non-industrialized nations, while offering the industrialized nations a 'soft' transition (Baer *et al.*, 2010a: 220).

How then would an equal share proposal benefit these two groups alike? As a more specific avenue towards the allocation of equal entitlements, the Contraction and Convergence approach (C&C) was suggested in the early 1990's by Aubrey Meyer from the London based Global Commons Institute (Meyer, 2000). Under a C&C approach every individual is granted an equal right to emit GHG's since every individual has the right to use the benefits provided by a shared resource. Second, a global cap is placed on emissions, on the basis of a scientific analysis of the amount of GHG's the global environment can withstand. Third, each nation is awarded an emissions budget consistent with the capacity of the global environment to absorb GHG's (Page, 2006: 177). This implies that the industrialized nations have to contract GHG emissions while the non-industrialized nations can raise their emissions for a limited time in the future. The non-industrialized countries can sell the emission permits that they do not require to industrialized nations in need of additional permits, thereby creating revenues to fund adaptation, development and poverty reduction, while the industrialized nations use the permits to soften their transition towards a renewable energy economy. Thus, after the contraction of the emissions by industrialized nations and the increase in emissions of non-industrialized nations, the emissions trajectory of both converges to an equal level.

A *sine qua non* for this scenario to be successful is the collective political will to determine the start and length of the convergence period (Simms, 2005: 178-179). Needless to say, the longer the transition's starting point is postponed, the more the problem is exacerbated and the more invasive the convergence trajectory will need to be. Current estimates show that to stabilize atmospheric levels of CO_2 at 440 ppm, which would correspond with a rise of 2 °C, a CO_2 peak should occur between 2020 and 2030 and the CO_2 emissions should decline to zero by 2052 (GCI, 2011).

Negative allocations

The advocates of the EPC presuppose the egalitarian premises of moral equality and argue that it would be inequitable to let responsibility for the problem determine the allocation of entitlements, for the simple reason that no person or nation has a valid claim to larger shares than his/her counterpart (Baer, 2002: 401; Singer, 2010: 190). Proponents of the EPC therefore reject Sven Bode's (2004: 311) suggestion that an emissions allocation based on historical responsibility for the climate problem can result in a negative allocation of entitlements. Steven Vanderheiden nuances Bode's view and notes that if each nation is allocated the same per capita share of the atmosphere, nations with a high level of past emissions can be assigned a lower per capita emissions cap while nations with lower past emissions should then be allowed higher caps (Vanderheiden, 2008: 229-230, 249). According to Vanderheiden historical

responsibility for climate change may be an appropriate factor when allocating responsibility for the problem and determining the duties that accompany such a responsibility. It is nevertheless complicated, he adds, by knowledge problems under a fault-based liability and it 'is entirely inappropriate for equity-based allocation issues that are properly based on egalitarian distributive principle and grounded in current rather than past claims' (Vanderheiden, 2008: 230). So, the culpability for the problem must be considered via the responsibility-based component, rather than through the assignment of national emissions shares.

Benchmark

Although the EPC's exclusion of historical responsibility for the problem is grounded in premises of moral equality, such an omission sets the EPC up for an injustice. If the allocation of entitlements is not based on historical responsibility for the problem, but on the emissions of a baseline year, for example 1990, which functions as the benchmark from which emissions are measured and distributed, nations that were the largest polluters receive the highest number of emission entitlements, whereas those who emitted the least at the time the benchmark was set obviously receive less. In our view, this is unfair for three reasons. First, if a benchmark is used, non-industrialized nations will have to cut emissions at a much lower baseline of emissions than the industrialized nations had in 1990 (Agarwal, 2002: 384). Second, the non-industrialized nations will already have to develop with a significantly smaller amount of emissions than the industrialized nations obtained. (Baer, 2010: 224) Third, asking non-industrialized nations to start cutting emissions over the next four decades presumes that by then they will have escaped from poverty. If they have not, and mitigation targets are imposed on them, they will be required to freeze their standard of living, thereby also freezing inequality. This would ensure that some nations will remain more developed while others remain trapped in poverty (Agarwal, 2002: 377).

If an emissions benchmark is used, a country's social and economic situation at the transition's starting point becomes highly relevant and this is even more so if the allocations are *grandfathered* or handed out for free (Vanderheiden, 2008: 238). Such models lock both rich and poor nations into their current situations, thereby freezing the world economic hierarchy. Even when a convergence path is pursued, the starting position will determine the situation of both groups. Vanderheiden points out that starting from a benchmark is 'impossible to justify by any standard of international fairness ... establishing de facto pollution rights that are distributed in a highly inequitable manner and locked in over time' (Vanderheiden, 2008: 238). Thus, although historical responsibility for the problem should not determine the allocation of entitlements in view of moral equality, using a benchmark year also has substantial flaws.

Ignoring heterogeneity: luxury and subsistence

In this section we will argue that the EPC is overly egalitarian, to such an extent that it ignores the *unequal* geographical and personal needs of people (Starkey, 2008: 47). Hence, a standardization of the EPC would be a threat to diversity since it proposes to hand each person an equal share in a world marked by inequality (Aslam, 2002: 190; Ott and Sachs, 2000: 169-170). The EPC ignores the difference between luxury and subsistence emissions; hence it disregards the role of emissions in human lives, as a result of its focus on the means instead of the ends of energy usage (Gardiner, 2010: 16; Shue, 2001, 2010). Steven Vanderheiden suggests allocating *modified equal shares*; i.e. the portion of available global emissions to be subject to egalitarian distribution ought to be luxury emissions, not total emissions (Vanderheiden, 2008: 226). In other words, we would first allocate subsistence emission rights to every individual. Vanderheiden notes, referring to Ronald Dworkin, that differences that lie outside an agent's control can form the basis for valid claims for *unequal* or *differentiated* resource allocation, 'and must do so insofar as these affect opportunities for welfare' (Vanderheiden, 2008: 227). But what qualifies as

being within an agent's control is not easy to ascertain, and since the agency of the individual is limited in this context, it is hard to determine which of the factors at work are subject to government responsibility or dependent on luck (Vanderheiden, 2008: 227). Since the deprivation of subsistence as a consequence of climate change lies outside an agent's control and significantly affects her 'opportunities for welfare', guaranteeing subsistence emissions to everybody seems only fair.

A fair package of goods: isolating carbon

Elaborating on this argument regarding the difference between luxury and subsistence emissions, Simon Caney refers to Amartya Sen and claims that our resourcist 'fetishism' blurs our notions of what we seek to accomplish through emissions since they are merely a means to an end. In other words, emissions only have value when they enable people to enjoy *capabilities*. 'It is therefore implausible to focus on distributing one particular resource equally if doing so will leave people *un*equal in their ability to pursue various goals' (Caney, 2009: 130). Moreover, as Caney explains, the EPC focuses on one good (emission entitlements) and isolates that good from people's access to all other goods. Why examine distributive principles for this one particular good when our principles of ethics focus on whole 'packages of goods' (Caney, 2009: 131)? When focusing on capabilities, not only emission entitlements matter but rather people's overall access to energy. This non-atomist argument becomes imperative when we consider the intertemporal dimension of climate change injustice, for intergenerational justice requires that the finiteness of our resources be addressed by creating energy availability that is not dependent on the production of GHG's.

A fair package of goods: isolating food

The critique of the resourcist view reappears when we look at nutritional needs. Various commentators have considered a C&C approach with regard to the overconsumption of meat and dairy products and the resulting rise of NH_4 (methane) (Garnett, 2009: 493; McMichael *et al.*, 2007: 1260). They propose to first contract the meat and dairy overconsumption in the industrialized nations, while allowing increased levels in non-industrialized nations where consumption is currently low, so as to, after a transition period, lower the ceiling consumption level to which low-income countries would then have to converge (McMichael *et al.*: 2007: 1260). Such a C&C approach, they suggest, should be combined with technologies that would limit GHG emissions from meat and dairy production.

However, Simon Caney's refutation is as valid here as in the case of emission entitlements. Those who focus on CO_2 or on meat and dairy consumption overlook 'the fact that principles of justice focus on people's overall package of goods and not on each individual component' (Caney, 2009: 133). In other words, what justice requires is a fair division of benefits and burdens. Simply contracting and converging meat and dairy consumption is a generalization that ignores the unequal needs of people, since individual requirements and personal tastes are heavily influenced by cultural preferences and regional economic potential (Aiking, 2010: 1). If not the former then surely the latter lies outside an agent's control and hence nutritional requisites qualify for a differentiated allocation. Although the World Health Organization's (WHO) recommendations include standard intake levels for fat, protein, iron, calcium and so forth, it does not specify levels of meat and dairy intake. A number of studies have affirmed that a plant based diet is perfectly able to provide the full range of nutrients needed to maintain a healthy diet while producing a substantially lower rate of emissions (Garnett, 2009: 496-497). However, in non-industrialized nations the access to a varied selection of foods is limited and attempts to alter cultural preferences by monetary incentives would harm the availability of nutritional requisites for the worst-off. While it is important that meat and dairy prices internalize the societal and environmental costs of deteriorating land, water, biodiversity and atmosphere, it would be unfair to simply leave it to a pricing mechanism to strive for a reduction in meat and dairy products consumption. Hence, a 'package

of goods' approach would ensure that every individual receives the nutritional requisites needed for a healthy diet (Garnett, 2009: 498).

Participatory justice

Although both the EPC and C&C model propose to allocate entitlements to individuals, they regard the state as the aggregate rights bearer. The underlying assumption is that the average properties of citizens form an adequate justification for state-based rights and responsibilities (Baer *et al.*, 2010a: 219). Such an assumption, of course, raises questions of participatory justice. If emissions are granted to the government, how will we make sure every individual receives what she is entitled to? For, as Simon Caney notes, if our approach assumes that individuals possess a set of human rights, then what arguments do the proponents of EPC have to install the state to govern these rights? Moreover, who vested in the state the power to sell emission grants (Baer, 2002: 403; Caney, 2009: 135)? What guarantees do citizens have that their government will allocate emissions fairly 'in a world in which rights and responsibilities are applied to countries and negotiated by persons nominally representing countries but actually significantly representing the interests of particular classes' (Baer *et al.*, 2010: 221).

When considering the responsibility-based efforts that industrialized nations will have to undertake, it would enhance participatory justice if we no longer focused on nations, but rather on groups *within* a nation. For, appointing the state as the aggregate right bearer ignores the vast differences of emission levels within states (Baer, 2010b: 247; Caney, 2009: 136). This is especially so since the GDP-standard on which we rely to determine a nation's wealth discards the gap between rich and poor, in both industrialized and non-industrialized nations. Focussing on groups within a nation: (1) would result in a higher contribution by the North, allowing the funding of mitigation and adaptation initiatives; (2) would enhance the level of fairness; and (3) would, quite possibly, persuade a larger number of the public to agree with the imposition of the required efforts. Why is this so? To differentiate between groups rather than imposing an equal per capita tax would result in demanding more from the most affluent, and since a strong correlation exists between income and emissions, the ability to contribute and the culpability of the richest groups are higher than those of the poor (Baer, 2010b: 255). Therefore, it is simply unfair to demand as much from the poor as from the rich, even within a fairly wealthy nation. Moreover, if the public, on a national level, would see that the burdens are being carried relative to the strength of the shoulders, people will be less reluctant to pay the imposed tax.

Conclusion

In this paper we focused on the most frequently suggested model for the allocation of emissions entitlements, the EPC, and its practical implementation, C&C. We identified some flaws of the EPC. Although we consider that negative allocations for those with the most historical responsibility would be unfair, in our view the caps placed on emissions need to be differentiated relative to the historical responsibility of the nation in question. We found that the alternative of benchmarking also results in an injustice, since it is likely to perpetuate the current gap present between industrialized and non-industrialized nations. The EPC turns out to be overly egalitarian, since it does not distinguish between luxury and subsistence emissions. We agree with Vanderheiden's proposal to allocate *a priori* subsistence emissions, since climate change lies outside's an agents control but affects her opportunities for welfare greatly. Our main critique concerns the EPC's and C&C's resourcist 'fetishism' which ignores that theories of justice should focus on 'packages of goods' rather than on separate goods. Therefore, as regards the future expansion of the production of meat and dairy products, people's nutritional needs should not be treated in isolation of other fundamental needs.

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Section 5. Ethics of non-agricultural land-management

Managing nature parks as an ethical challenge: a proposal for a practical tool to identify fundamental questions

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Abstract

In 2010 the Report of the second International Commission on Management of the Oostvaardersplassen (OVP) was published. This international committee evaluated the management of one of the largest wetland reserves in the Netherlands. The results of this evaluation were of high public interest, because the OVP is a controversially debated topic in the Netherlands. This debate has mainly resulted from the introduction of a number of large herbivores to this area, such as Heck cattle, konik horses, and red deer, to maintain short grassland for grazing by geese. This measure had been taken as part of the initial management style of minimal intervention in the OVP, in order to allow 'natural ecological processes to operate' within the area. However, this non-intervention policy elicited a fierce debate on our duty of care towards these animals, when the harsh winter of 2009/2010 resulted in an unusually high winter-mortality among large herbivores. Are these animals to be considered part of nature, with animals suffering and dying by starvation as a part of natural processes? Or are they to be treated as kept animals towards which we have direct duties to prevent harm and suffering? On top of this problem, the question arises whether one should assess these dilemmas from the perspective of the individual animal or from a population-oriented perspective. Up until recently, these questions were – at the level of policy – mainly discussed as rather technical issues that demand further ecological expertise or input from veterinary and animal sciences to be solved. The ICMO2 evaluation explicitly tried to include the moral dimensions in their scientific evaluation. In this paper we present the framework that has been used in order to explicate and structure the ethical questions that play a central role in the management of the OVP. This framework offers a tool for practical ethical deliberation and aims to provide room for fundamental ethical presumptions and moral ideals.

Keywords: nature management, welfare, wild life, ethical assessment

Introduction

The Oostvaardersplassen (OVP) is one of the largest wetland reserves in the Netherlands and came into existence when the South Flevoland polder was reclaimed in 1968. The nature reserve (56 km^2) is designated as an European Special Area of Conservation (SAC) and participates in the 'Ramsar Convention', an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their Wetlands of International Importance and to plan for the 'wise use', or sustainable use, of all of the wetlands in their territories (1971). To maintain open shallow pools and grass lawns as feeding ground for wetland birds, such as greylag geese (*Anser anser)*, great white egrets (*Casmarodius albus*) and others, free-ranging populations of primitive breeds of both cattle and horses were introduced in 1983 and 1984 and red deer (*Cervus elaphus*) were later added to the system (in 1992). Populations are unmanaged (except for humane destruction of animals *in extremis*) and entirely self-sustaining. Over the last 40 years the OVP area has developed into a wetland area of international importance and has been designated as a Natura 2000 area based on the bird directive. The council of Europe awarded a European diploma for nature conservation to the OVP in 1999, which was renewed in 2010.

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Thus, the OVP developed into an area with high natural values, especially for wetland birds. The undisturbed wetlands proved to be very important for a number of waterbirds that either live there for most of the year, during the wintering, or that rest and feed on their migration to other countries in the South and the East. Furthermore, the variety of species is unique from a Netherlands perspective.

As the aim is to allow ecological processes to operate, the policy is one of minimal intervention. In terms of management, water management and grazing are considered the most important measures (ICMO2, 2010). Soon after the introduction of the grazers, the number of these animals increased and their presence was more and more understood as a constitutive component of the ecosystem and for the natural dynamics. Currently, the area is even characterised by these large grazers that live in wild herds, partly because of their central role in the management and partly because these large herbivores became a dominant image for and characteristic of the OVP. Thus, the introduction of these large grazers appeared to be rather successful; however it equally resulted in new questions and problems.

The flip side of success: from animals in nature to animals in the public debate

In spite of the many positive aspects of the OVP, the nature reserve received a lot of negative public and media attention in recent years. This was mainly the result of a combination of the increasing population of herbivore species, resulting in discussions on acceptable carrying capacities of the area, and some long and harsh winters (2005/6, 2009/10). As a result of these winters a relatively high number of animals died during winter. However, the overall winter mortality did not exceed a percentage known for wildlife populations of grazers and it may be argued that high rates of winter mortality simply are part and parcel of the course of nature, necessary to keep or restore the balance of an ecosystem. Others argued that such prolonged periods of significant health and welfare problems of the (individual) animals were unnecessary and considered it morally unacceptable to let these herbivores suffer to death. In spite of an international evaluation committee (ICMO, 2006) and some law suits started by the Dutch Animal Welfare Association (2007), the underlying moral questions remained unsolved and the public debate on how one should deal with these animals reached a new peak during and after the harsh winter of 2009/2010. The two central questions were:

1. Are these animals to be considered to be 'wild' or 'kept' animals? And, if they are 'wild', could we evaluate the suffering and dying by food shortage as part of their natural living? Or are these animals, being artificially introduced into a closed area, to be treated as kept animals, resulting in a direct duty for managers to prevent suffering and harm of animals under their care? From a legal perspective, it has been reemphasised by the courts that all animals in the OVP are to be classified as 'wild animals', because they are part of the ecosystem. Irrespective of this principle statement, the courts determined (Gerechtshof, 2007) that animals in poor condition without foreseeable chances to survive [in late winter] should be culled and should not be left to die naturally, which was in line with the recommendations of the first evaluation committee (ICMO1). However, the understanding of the principle 'wildness' of the animals actually was counteracted when, in response to public protests, management of the OVP (Staatsbosbeheer, SBB, 2010) was instructed by the government to provide the large grazers with supplementary feeding in late winter 2009/10.
2. As another central aspect of the discussion, the question arose whether one should assess animal welfare dilemmas from the perspective of the individual animal or from a more population-oriented perspective. As a matter of fact, 'natural' population dynamics imply selection processes that will lead to the death of less fit individuals in the course of harsh environmental conditions. This selection however, will strengthen the overall fitness of the population and it has been argued that management measures for a 'natural' population should be directed towards the herd rather than being based on individual cases.

Up until recently, these questions were – at the level of policy – mainly discussed as rather technical issues that demand ecological expertise and/or input from veterinary and animal sciences to be solved. The moral dimensions had been mentioned and analysed in scientific papers (e.g. Drenthen *et al*., 2009; Keulartz *et al*., 2004; Swart and Keulartz, 2011), but were not really addressed in the policy with respect to the actual management of the OVP. The second International Commission on Management of the Oostvaardersplassen (ICMO2), which was established in 2009 to re-evaluate OVP management, explicitly aimed at including the moral dimensions in her evaluation. For this aim a framework has been used that has been recently drafted by the Netherlands Council on Animal Affairs (RDA, 2010) in order to make explicit, structure and analyse moral issues in policy.

A framework to analyse ethical problems in a policy context

The Netherlands Council on Animal Affairs issued a report entitled 'Moral issues and public policy on animals' (RDA, 2010). In this document the Council recommended the Dutch government policy on animal welfare and animal health to be more consistent and transparent, and to pay attention to the fundamental moral assumptions that underlie many animal-related problems. As a start the Council proposes a comprehensive 'Assessment Model for Policy on Animals' that may help to make explicit, structure and analyse moral issues in policy. Such assessments should be public, transparent and based on the most recent scientific knowledge as well as broadly shared public moral views. Ideally, these public views were to be derived from a full ethical assessment, which is to say, the result of a reflection process that incorporates intuitive judgements, knowledge and moral principles. The application of the assessment model is not restricted to practical questions of the morally 'right' action, but also aims at explicating discussions on more fundamental questions related to the moral good.

The assessment model exists of two parts (see Figure 1). The left column of the framework is focused on the applied value assessments, such as the question whether the killing of a group of animals during an outbreak of animal disease is justified. The right column addresses broader and more fundamental questions related to a specific question, such as moral ideals on animal disease prevention. Commonly ethical issues only tend to become explicit in a policy context if there is a clear need to deal with a specific problem, e.g. whether or not to shoot potentially suffering animals in the OVP. The moral questions that underlie such a specific problem often remain unaddressed. The aim of the right column is to explicate these more fundamental questions in a way that is beneficial in addressing the current dilemma, but also in drafting future policy.

The model or framework builds on the idea of ethics as a reflection process in which one strives for an equilibrium of a number of moral elements, including intuitive judgments, facts, principles and moral ideals (cf. Rawls, 1972; Van der Burg and Van Willigenburg, 1998). The model starts with the intuitive judgements, i.e. the first impressions people may gain in a specific case. Intuitive answers often come to the fore in discussions about animals. In the search for a reflective equilibrium these intuitions are considered to be a moral marker. They usually indicate that there is a moral problem or a question at stake. Still, such intuitions only are a start of an ethical reflection: A first reaction can be valuable, but people may also be mistaken due to lack of knowledge or the lack of acknowledging others´ interests. Therefore, morally relevant facts and ethical principles play a key role in the ethical consideration. The principles and relevant facts are employed in critical reflection upon intuitive judgements. This requires a critical reflection of the similarities and differences between first impressions, principles and facts. If it turns out that there are inconsistencies, one has to evaluate underlying causes and examine which parts are in need of modification. Once coherence is achieved between the intuitive judgements, the principles and the facts, a reflective equilibrium has been reached.

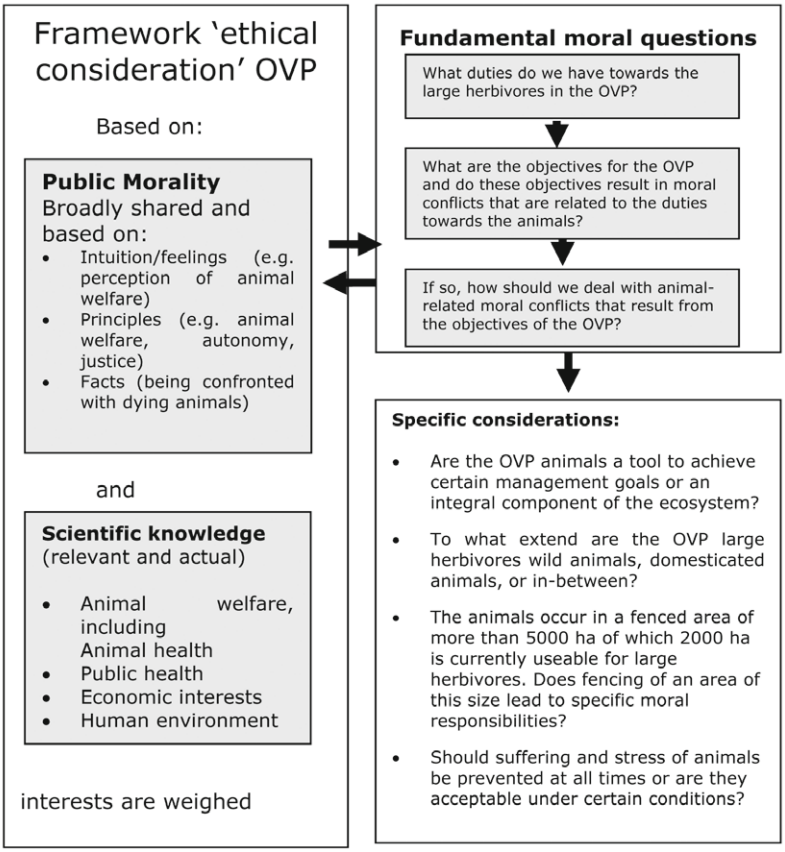

Figure 1. 'Assessment Model for Policy on Animals' used for the ethical questions related to the management of the OVP.

The application of the framework for the moral questions raised in the management of the OVP

The assessment model is not a decision making tool that functions as a one size fits all approach for practical ethical dilemmas. Thus, it should be clear that such an ethical framework is drafted rather in order to identify the relevant ethical questions and identify potential moral dilemmas than to yield straight forward management or political solutions (see also Ohl & Van der Staay, 2012). For the moral dilemmas in the management of the OVP, the framework has been used (1) to structure and focus discussions about the ethical dimension of current and possible future management of the OVP; and (2) to bring together otherwise incompatible moral and factual aspects (Figure 1; ICMO2, 2010). It was stated that:

- The biological reality that natural processes potentially imply time-limited periods of less positive or even negative welfare conditions in animals can result in a conflict between scientific facts and societal intuition. It was this dilemma that resulted in the intense societal and political debate around the question whether an extensive period of food restriction and, thus, hunger in wild or free-ranging

grazers in the OVP over the winter period did or did not lead to unnecessary animal suffering and thus constitutes a welfare issue.

- On a purely scientific basis, it is clear that most temperate ungulates pass through periods of food abundance, and food shortage at different times of year – and are indeed well-adapted to bolster any shortfall in food intake in seasons of shortage, by mobilising fat reserves deposited during periods of comparative abundance (e.g. McEwen *et al*., 1957; Kay, 1979). In periods of the year where energy gained in daily food intake may be smaller than the actual energy expenditure should not necessarily be seen as a compromise to welfare, because the animal has explicit adaptations to deal with such an imbalance.
- The large herbivore species, albeit artificially introduced, were considered over time as a component of the ecosystem instead of being understood purely as a nature management measure. Non-intervention of this semi-natural system was given a central position in the management and communication on the OVP ecosystem. Because of the nature of the systems however, there is in fact some mismatch between summer and winter population-based carrying-capacity. In consequence, members of the public suppose that animals are exposed to unnecessary suffering by prolonged periods of hunger. Society felt that some management intervention was justified or actually required when introduced grazers were exposed to prolonged food shortage – even though non-intervention might be scientifically justifiable. However, pursuing the argument that exposing kept animals to prolonged periods of hunger is generally understood as a matter of animal mistreatment, society argues that there is no obvious reason that this should not equally apply to freely living animals, especially where humans have assumed some responsibility for management. Thus, the moral understanding of the Dutch public is that a moral obligation remains to take all necessary measures to minimise the extent of unnecessary suffering.

Conclusion

In her report ICMO2 concluded that as a scientific fact

> ...natural processes potentially imply time-limited periods of less positive or even negative welfare conditions in animals (e.g. being exposed to cold or limited food), as part of the natural dynamics (e.g. natural seasonal cycles in body condition). ICMO's criteria for welfare do not require that animals should be entirely protected from food-shortage and hunger or thirst etc, but that all individuals should have the opportunity to respond appropriately to such privation.

However, based on the above-mentioned framework that also take societal concerns into account. The overall conclusion of ICMO2's ethical considerations was that 'long periods of food restriction resulting in large scale unnecessary suffering and subsequent starvation of animals as a result of living conditions partially created by man is morally not acceptable, and has to be prevented.'

This ethical consideration and the resulting advice of ICMO2 emphasises the fact that animal welfare issues cannot simply be resolved by using objective biological measures. Instead, welfare (and the management of welfare) remains a complex interplay between scientific formality, ethical reflection and public perceptions.

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The citizens forest model: climate change, preservation of natural resources and forest ethics

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Abstract

Climate change, air pollution and especially short-rotation forestry are the main causes for increasing detrimental effects on forests. Therefore, it is urgently necessary to find effective counteractions to this damage so that forests will become resistant, grow sustainably, and are more economically effective and thus contribute optimally to the common welfare of all citizens. 'Continuous mixed forestry', in contrast to the normally used short-rotation or age-classed-forestry, is one suitable model to counteract climate change and air pollution in this way on both the local and national level. It is forestry without clear-cuts and biocides and with soft logging by continuous thinning and natural regeneration. The necessary change to this sustainable cultivation model is generally possible and necessary all over Europe and in other areas of the world. A very good chance for this type of forestry is available now within the framework of selling state-owned forests to private investors. This selling is planned by governments in some countries like the Great Britain and has been partly realised on a large scale in Germany. This article proposes selling the state-owned forests to a central, private national heritage foundation as a first step instead of transferring them with their traditional, mismanaged short rotation or age-classed forestry to private investors who would continue the state mismanagement. The task of the foundation would be to organise the 'citizen forest society' as a social-ethics based society that is privately owned by citizens and the foundation. This would generate ecological advantages for the forest and, moreover, long-lasting profits for citizens because the foundation would establish other organisations where the citizens become responsible owners of 'their' forest without any governmental or third-party influence. This proposal describes a solution to the demands of social-oriented ethics, which are primarily focused on the cooperation of responsible persons, represented by the private ownership of the forests, and directed by a responsible foundation.

Keywords: continuous mixed forestry, citizen forest society, social forest ethics

Introduction

Forest ethics has been scarcely discussed in Germany and in other parts of the world. While the little discussion that exists in Germany is focused on social ethics strongly influenced by Christian tradition and is mainly based in one outstanding publication (Hangartner, 2002), the dialogue on the international level is concentrated on the ethical discussion towards collective global forest ethics, in particular having to do with tropical rainforests. On the one hand, this deficit is due to the ruling narrow anthropocentric view of ethics; on the other hand, it is due to the urgent problems of tropical rainforests throughout the whole world.

Social ethics is more or less the only discussed ethics model for forests in Germany. It is focused on the social conditions of a good life. This includes sustainability, for example, as an important part of the further existence of mankind. Thus, social ethics is not primarily focused on single persons with their isolated activities but on the cooperation of responsible persons or groups. And those responsible persons, the citizens, should be enabled by the governments and the possibilities of the different legal

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systems to cooperate together as citizens who take care of their own assets (here forests) in a sustainable manner. This model takes into account that all life, including that of plants, is a given asset (in the Christian sense by their creation) and should be protected as an important part of this asset.

This contribution presents a blueprint for a new model for the management of forests that is based on these social ethics. It is called the 'citizens forest model' and mainly consists of two parts, the first being an environmental one that meets the demands of all different ethical approaches with its goal of effective sustainability for the forests and thus the preservation of natural resources. The second one is the organisation of the permanent control over sustainability and the permanently free access to forests for citizens, combined with the component of one great, singular profit for the government by selling the forests to the foundation and a long-lasting profit for the buying citizens.

This contribution begins with the demand for effective forest sustainability and then develops a concrete model that is mainly focused on the situation in Germany but is equally applicable to other countries in Europe and Asia.

The superiority of continuous mixed forestry

Detrimental effects on forests have significantly increased over the last decades and all over the world. This is one reason why the German term 'Waldsterben', for example, has become an internationally known and used term for severe damage to forests. And in spite of some traditionally existing sustainable cultivation methods or newly introduced changes in some regional forestry, it is clear that a fundamental change still has to come about. The prevailing and dominant method is the short-rotation forestry in sylvan cultural management in European forests. The reason for this is that the demand for timber is increasing tremendously. In spite of extensive forest plantation, Great Britain, for example, is only able to harvest around a quarter of the annual growth of timber from its native woodland and only 60% of its conifer forest each year. That means that an intensive forest plantation with short rotation forestry as well as age class forestry (= monocultures) and the use of big machines seems to be – at first glance – the most suitable, effective and economic cultivation method to get a growing output every year.

This procedure is little different from the procedure for a field of corn: what short rotation forestry needs is fast-growing species. These species, with mostly identical genomes, are planted in forest areas homogenised with heavy machines. After short-term mass growth, these woodlands are again harvested with highly mechanised methods. The product will be wood fibre, which functions both as a resource and as a low-quality energy source. The goal of short rotation forestry is to produce the biggest mass within the shortest time at the lowest costs. This economic approach contradicts all the requirements of effective sustainability and is costly in terms of labour, energy and capital. At first glance, the attainable timber sales profits are higher in comparison to other forestry models but after a few rotations they need to be supported by a costly nutrient supply. Short rotation forestry in Central Europe is a typical meander which is only profitable under circumstances of short-term profit-seeking for a short time. Biological and ecological costs remain unaddressed and the general public is burdened with these costs.

Age class forestry is based on a forestall-historic heritage with elements of short rotation forestry. It often consists of only one, generally fast-growing forest species such as the common spruce or the Douglas fir. These coeval monocultures (thus the term 'age class forestry') grow to young full-grown trees that are completely harvested after a couple of years, This happens at the end of the main growth period, a long time before the trees' biological maturity at the age of 60 to 80 years. When a new tree generation is planted after a clear-cut, it takes decades to regain the social and cultural functions of adult trees (Bode, 1997).

It has long been discussed that both short rotation forestry and age class forestry are characterised by numerous risks, particularly because of their large-area vulnerability to catastrophes caused by hurricanes, insects, summer aridity and snow damage. However, the heaviest burden of age class forestry is its lack of profitability. Because it has to charge interest on its initial costs over the long-lasting period of growth of high forest tree species, the slow tree growth cannot overcome interest rates. This will apply even more if, due to risks, more than 60% of its harvest is to be brought prematurely on the market at unfavourable prices. Age class forestry unavoidably leads to:

- less average stock of wood;
- poverty of structure and tree species;
- high habitat competition among the trees; and
- retarded nutrient transactions and a decrease in natural diversity.

Continuous mixed forestry is superior on all counts to the aforementioned forestry types; it is forestry without clear-cuts and biocides and with soft logging by continuous thinning and natural regeneration. Continuous mixed forestry is also known as 'common sense forestry' or 'sylvan culture close to nature'. This sylvan culture is based especially on domestic or even regional and non-genetically modified broad leaf tree species. Continuous mixed forestry exploits its timber in the ecologically rich and solid optimal maturity phase; thus, the trees of the upper stands are allowed to mature to uneven-aged mixed stands and are harvested as healthy full-grown trees in the course of the target diameter harvesting regime at the time of their maximum value tree by tree and free of clear-cuts. As a result of the continuous penetration of the canopy caused by single tree selection, light increase, nutrient transaction, tree species composition and ongoing natural regeneration is stimulated. Due to its durable forest stand, continuous mixed forestry provides a continuous woodland biotope with high resilience. These biological advantages increase over time, provided that the operational method is consequently applied. At the same time, the frequency of costly intervention gradually decreases. Finally, there is a highly structured, well-stocked, multi-layered forestry with enormous value added, which replaces the typical forestry techniques necessary in age class forestry by 'biological automation' (which works without plantation, forest protection, natural selection, first thinning, etc.). These and other characteristics have made continuous mixed forestry – under the socio-economic conditions of European high-wage countries – the most profitable forestry model in Central Europe for decades and the most effective one in the fight against climate change (Bode, 2010: 119; Bode and Hohnhorst, 2000; Knoke, 2009; 2007; Röhrig *et al*., 2006).

If we focus on the social conditions of a good life with social ethics and ask which model fulfils them best, the answer is obvious: from all points of view, continuous mixed forestry because it includes sustainability, for example, as an important aspect of the further existence of mankind without contradicting economical effectiveness. Continuous mixed forestry is the most effective model of forestry. It takes into account that all life, including that of plants, should be protected as a basis for mankind and, in a religious or metaphorical sense, as an important part of creation. On the philosophical-ethical level, the model of continuous mixed forestry is universal for all countries with such forests. (For the rain forest, we need special argumentation; thus, we do not include it here in this model.)

Establishment of a central private natural heritage foundation

From the perspective of nature protection, it is both reasonable and necessary to use such a woodland cluster economically in order to both arouse and preserve the local protective interests of citizens or, in other words, to make them local wardens of the countryside. The most efficient and most economical management and maintenance of these areas is assured by transferring the management of these areas to a central and private national heritage foundation (a 'national forest trust'). This foundation must undertake the task of establishing and preserving continuous mixed forestry by incorporating the know-how and the responsibility of wildlife charities and their voluntary potential. With all the

woodlands for sale, a unique, exemplary and highly productive organisation would be established. This organisation could, among other things, professionally focus on refinancing its primary costs and generating revenues (Borchers, 1996).

The establishment of such a long-maintained natural heritage foundation could be self-financing and without increasing the burden on the governmental budget in the course of the transformation of national forestry. The organisation of a foundation model has several advantages: its charter is registered in the public registry; it is a corporate entity and enjoys legality without having a beneficial owner and it has a perpetual life. The foundation would be established as a legally independent organisation provided with irrevocable assets. It could operate these assets according to its own guidelines, and it is entitled to act economically within its own legal framework. The main task would be the establishment of ecologically and economically optimised effective continuous mixed forestry. As a side effect, it would be a model for how to run private forests profitably. Moreover, considering that the foundation will have to prove itself on the market, it should be more efficient than a bureaucratic governmental organisation.

The foundation's primary task would be to pursue the ambition of continuous mixed forestry. This objective must be written irrevocably into its constitution so that it can be altered only if absolutely necessary and all trustees consent. This is because continuous mixed forestry has proven to be the optimum forestry model for more than a century and there will hardly be any reason to refrain from it.

The second task of the foundation would be to organise the 'citizen forest society'. This would be the transformation of public forests into citizens' forests but in such a way that they are truly and privately owned by citizens; this would generate a singular profit for the government, ecological advantages for the forest and, moreover, a long-lasting profit for the citizen.

So far, the benefits of continuous mixed forestry and the taking over of public forests from national property have been presented. Just the last element is missing, namely, that the citizen is able to make use of his forest in the various ways that are due to him. The state or other interest groups would not be allowed to take action; the forest would be ecologically optimised and citizens would benefit from sale profits. These would increase due to the fact that growing demand will make the forests more and more valuable. This is possible because the foundation would establish another organisation where the citizens become owners of 'their' forest without any governmental or third-party influence: a public limited company. Forest property would be transferred to the latter and citizens can acquire shares and become shareholders, respectively. At the same time, the public limited company would be unalterably defined according to the corporate purpose of continuous mixed forestry (Simon, 2012).

This method has several advantages:

1. The state indirectly receives its money from the sale of the forests via return flow from the foundation (singularly and limited to the selling value of the forests).
2. A millionaire or other interest groups would be prevented from acquiring the forests and eventually denying access to citizens. The forests would be purchased by the citizens themselves, who become shareholders. Nevertheless, regulations would have to be implemented hindering the concentration of too many shares in only a few hands. That could be easily stipulated in a constitution so that nobody would obtain more shares than planned.
3. The public limited company would statutorily provide that woodland property must not be made smaller but should be expanded by additional acquisitions. Therefore, citizen forests all over Europe and in other parts of the world will attain great importance for the ecological future of forests at large. Citizen forests could also be an instrument of old-age pensions if citizens invested in shares of the foundation; this would, therefore, serve as an incentive for the government to further expand this sector which would not only be cost-free but also a source of tax revenue. In times of sustainable

investments, it would be a great opportunity to offer citizens the same prospects, because wood is valuable and will be valuable in the future. Moreover the wood value would increase, growing from year to year.

Conclusion

Continuous mixed forestry, in connection with the citizen forest model, meets all demands of different sustainable, economical and ethical approaches. As social ethics demands, it is not primarily focused on single persons with their isolated activities but is focused on the cooperation of responsible persons or groups. And those responsible persons, the citizens, should be enabled by the governments and the possibilities of the different legal systems to cooperate together as citizens who take care of their own assets (forests) in a sustainable manner in this model. Finally, this proposal is a decisive step towards a sustainable forest economy for many European countries and other countries of the world with such forests as described above, and an outstanding example of how to organise a part of a sustainable ethics-based civil society.

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'Good change' in the woods: conceptual and ethical perspectives on integrating sustainable land-use and biodiversity protection

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Abstract

The interrelations between land use, protection of biodiversity, mitigation of and adaption to climate change are contested. Hence possible synergies as well as conflicts have to be identified. But not only empirical data, models and scenarios have to contribute here: Conceptual and ethical perspectives play an important role for adequately setting and enacting the agenda. A realistic and feasible integration of climate change adaptation and nature conservation is a general and accepted goal. Within this, one building block should be a justified concept of 'good change'. This is of importance for both land-use and conservation since both often tend to stick too closely to static concepts of alleged stability of existing states of nature. However, 'good change' neither is to be confused with a downplaying of disastrous effects of climate change nor with an uncritical affirmation of change per se. In this paper forestry shall serve as a specific example for the needs of integrating sustainable land-use and biodiversity protection with regard to climate change. A normative concept of 'good change' entails goals, criteria, and measures for protecting and promoting biodiversity as well as for sustainable use. But even in forestry, the field of birth of sustainability, it is far from clear which strategies of mitigation and adaptation are to be sought, for example with regard to (1) importing non-indigenous tree species as a means of precaution to climate change; (2) contrasting or combining wild woods, extensive forestry and intensive short rotation tree-farming; and (3) a hierarchy of goals for using forest products (timber, fuel, etc.). 'Good change' shall serve as a somewhat neglected part of the much more encompassing notion of sustainable development. For example perspectives on biodiversity have to go beyond instrumental expressions of ecosystem services and other functional approaches. It shall take seriously the dynamic perspective of natural and cultural processes, also regarding the too sharp distinction between forestry and agriculture, and a revised notion of what naturalness or integrity might mean. 'Good change' shall be part of ethically sound decisions about which measures are to be taken against undesirable developments and how to act in favour of desirable change.

Keywords: ecological dynamics, sustainability, ethics, forestry

Sustainable development, change and climate change

In the context of the United Nations' debates on environment and development – too often misattributed as being contradictory goals – the very notion of change appears as a cultural and political perspective: 'Yet in the end, sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs' (UN, 1987: I.3.30). This cultural-political perspective, however, has long been accompanied with ideas of natures' balance or stability, where change has been conceived of as cyclic; only evolution as a long-term process was regarded to bring about 'natural' unidirectional change. Short- and mid-term change mainly was attributed to the activities of humans, and more often than not these alterations have been valued as negative. There are convincing arguments provided for this view also in the 'Brundtland Report' (UN, 1987).

In that vein of negative outcomes of anthropogenic action regarding the environment, climate change has been identified as one of the major driving forces of biodiversity loss for the next decades. Hence, the goals and means of the United Nations' Framework Convention on Climate Change (FCCC; UN 1992a) and the Convention on Biological Diversity (CBD; UN 1992b) will have to be integrated, also on national (and European) levels for maintaining and conveying biodiversity as well as for sustainable development under the conditions of climate change. The interrelations between nature conservation, protection of biodiversity, mitigation of and adaption to climate change have to be clarified. Possible synergies as well as conflicts have already been identified (Paterson *et al*., 2008). The most contested issue is the use of agricultural land and crops for fuel production, but also the conversion of forests with old tree stands into short rotation tree farming and the use of almost all biomass from forests hence a loss of wood and leaf litter for decomposition into soil at stake.

But not only empirical data, scenarios and practical methods have to contribute here. Concepts and ethical perspectives play an important role in adequately setting and enacting the agenda. Ultimately this inclusion will contribute to a realistic and feasible integration of climate change adaptation and nature conservation. One building block should be a justified concept of 'good change'. This is of importance for both land-use and conservation since both often tend to stick too closely to static concepts of stability of existing states. However, 'good change' neither is to be confused with downplaying disastrous effects of climate change nor an uncritical affirmation of change per se. After some general considerations, in the second part of this paper forestry serves as a specific case example for the needs of integrating sustainable land-use and biodiversity protection with regard to climate change.

Change as a challenge

A long-standing general problem of conservation and its policies reads: why should we sustain or even restore a certain state of nature if it is constantly changing anyway? The last decades have spawned concepts of a more dynamic outline of biodiversity protection on all levels, from populations to ecosystems (e.g. Botkin, 1990). The conceptual shift from pattern to process, however, has not made clear whether processes themselves have become the new protection goal(s). It seems that often processes are understood mainly as means for maintaining those habitats and inhabitants that require ecological dynamics. In the latter sense, process is understood instrumentally. But in other cases, natural processes are conceived of ethically as goals in themselves with intrinsic value, hence becoming more important than e.g. specific species' or landscape protection goals (Potthast, 2006). This tension remains unresolved and applies even more under the conditions of climate change. But should one give up the idea of maintaining specific species and habitats at all? The latter seems to be grossly overstated and misleading as well as politically counterproductive. But some protection concepts, goals and goods will be challenged and – like it or not – have to be adjusted. All this does not preclude, however, the necessity of mitigation: Since major adverse effects on humans, ecosystems and biodiversity are to be expected, lowering the extent of anthropogenic contribution to climate change is well justified regardless whether nature changes anyway. In that sense, human action resulting in no or slow contribution to climate change is morally preferable. This initial ethical perspective on mitigation will not be elaborated further but shall be regarded as a major frame for the following discussion.

Natural and anthropogenic change

Even a dynamic approach of protecting natural processes – as opposed to certain states with a fixed set of biodiversity elements – distinguishes between anthropogenic and natural change. This happens on both the empirical and the valuation level. In the first instance the difficult empirical question arises whether or to which extent certain changes within ecosystems are caused naturally or by human action. On the normative level the question remains to justify why natural changes should generally be considered good

whereas anthropogenic changes are less preferable. Concepts within conservation as well as of sustainable development have challenged the rigid evaluative supremacy of the 'natural' anyway: cultural landscapes, old local forms of cultivated plants and livestock within biodiversity protection and so on. Nevertheless, telling apart natural and anthropogenic change still remains to be one of the conceptual foundations of conservation, mainly because non-altered processes have become more and more scarce, with all ensuing effects on a large sector of biodiversity. But in the face of climate change effects, the separation between natural and human-driven change becomes even more blurred. Hence on the empirical level, 'wildness' as the idea of actual non-interfering gets detached from the notion of 'unaltered' nature. But ethically speaking, this does not at all inflict on the necessity to justify all human action (and forbearance) with regard to their effects on biodiversity and climate change. The challenge of adequately describing and valuing transformations in and of nature intensifies.

Good change

In some sense, climate change and 'good change' pose a paradox for conservation that reminds of the sceptical dictum from philosopher Theodor W. Adorno (1951: 59): 'There is no right life in the wrong one'. If for good reasons we should act for halting climate change since the latter will mostly result in unwanted alterations, how could 'good change' look like in the first place? Wouldn't simply preserving the status quo of nature and environment be the best? Obviously, this is not the case, since it implies a couple of problems:

- Present situations are not per se good points of reference since they might include several negative states, trajectories and processes.
- Due to anthropogenic change in general and climate change in particular, neither present nor historical states of reference make very much sense not least because they might well never be reachable again.
- Global dimensions of climate change make it even more problematic to tell apart natural from human-induced causes and processes.

This situation makes it (even more) implausible simply to reject any change. But at the same time uncritical affirmation of any change in nature and environment or accepting all change as without alternative neither does make sense. 'Good change' may not be confused with a downplaying of disastrous effects of climate change nor with an uncritical affirmation of change per se. In response to this situation, new approaches of environmental ethics and sustainability have to be developed to identify desirable changes of nature or the environment, respectively. A normative concept of 'good change' requires the formulation of goals, criteria, and measures for biodiversity protection and promotion, which already include strategies of mitigation and adaptation. To meet these needs conservation even more has to focus not only on protected areas but on 100% of the land. But again, on the practical level this still would be in accord with some classical safeguard approaches protecting large areas as well as networks and corridors of habitats. The increasing speed and magnitude of natural and anthropogenic change will convey the need to establish new goods and goals beyond "to keep every cog and wheel (a)s the first precaution of intelligent tinkering", as Aldo Leopold (1953: 190) once put it. As reasoned above, the notion of 'good change' still qualifies global climate change as an overall negative process to be halted or slowed down. But one should note that the often-mentioned example of intensive and large scale land-use for agro-fuels neither is good for biodiversity protection nor for a climate-sensitive sustainability (e.g. Searchinger *et al*., 2008).

Policy targets of present (sometimes naïve) conservationism have to be revised not least with regard to the concept of biodiversity framed by the CBD (cf. Potthast, 2007). This includes the role of 'naturalness' as the main or only focal point for the derivation of values. The role of naturalness has to be reassessed as an important but not all-encompassing goal and criterion. Species and habitat changes should not be per se

viewed negative in relation to earlier 'historical' benchmarking. The evaluation of biological invasions and 'alien' taxa has to be revised. At the same time, existing tendencies of uncritically welcoming all change will have to be put into question. Most notably, the targets need to be expanded with regard to human-nature interaction for sustainable development. On the other hand, processes as goals need at least some indication of the pathways and trajectories to be taken, notwithstanding that no fixed goals might be targeted. Nature conservation and sustainability do not overlap completely: the *differentia specifica* of the former lies in some sense of eudaimonistic (good life) and/or intrinsic value of biodiversity not to be covered completely by sustainability. 'Good change' shall thus provide input for more encompassing notions of sustainable development with perspectives on biodiversity reaching beyond ecosystem services and other functional approaches.

'Good change' and forestry

An international consensus on the protection and sustainable management of forests was set out in the context of the United Nations Conference on Environment and Development (UNCED) in Agenda 21 (Chapter 11) and the 'Forest Principles' (UN, 1992c). Forest elements are to be found also in chapters of the Convention on Biological Diversity and the Framework Convention on Climate Change. In stark contrast to agriculture with its primary goal of food supply, notwithstanding classical fibre and recent fuel purposes, forestry has a much broader spectrum of targets: 'wood and wood products, water, food, fodder, medicine, fuel, shelter, employment, recreation, habitats for wildlife, landscape diversity, carbon sinks and reservoirs, and for other forest products' (UN, 1992c: 2b). On the one hand, forestry always was much more long-term oriented for obvious reasons. On the other hand, the idea of a relatively stable environment has been the basis of calculating for rotation periods between 50 and 250 years. Climate change thus challenges forestry in two ways: (1) during the growth period of much less than one generation of trees, irreversible environmental change will occur; (2) uncertainty of future developments will increase much more due to the regional and local differences and complexities of the climate change process. As a consequence even in forestry, the field of birth of sustainability, it is far from clear which strategies of mitigation and adaptation are to be sought, for example with regard to (1) importing non-indigenous tree species as a means of precaution to climate change; (2) contrasting or combining wild woods, extensive forestry and intensive short rotation tree-farming; and (3) a hierarchy of goals for using forest products (timber, fuel, etc.). In the following, only some very preliminary considerations shall be presented in order to open up discussion points to further consideration.

Non-indigenous tree species as a means of precaution to climate change

Since in most parts of western and central Europe, a warmer climate with more drought is to be expected, it has been suggested to plant ecotypes of the same species from more southern parts as well as to import other tree species which should be capable of coping with the new conditions. Precaution has a double meaning here. On the one hand it means taking care for future developments by the respective action. On the other hand there is a need to reflect on possible consequences and side-effects of growing (i.e. planting) non-indigenous tree species. With regard to a high genetic diversity within local populations of all important forest tree species, it might be advisable to put the emphasis on natural rejuvenation of trees at their stands – with the chance of mid- and long-term adaptation by differential growth success. In this perspective, one would prefer a strategy of drawing on local conditions for coping and hence adjusting for a good change within and by existing tree populations. This is based on assumptions of biological adaptation processes of cultivated, semi-cultivated or wild plants (like forest trees) that will develop best under the local conditions of use and in the respective spatio-temporal context. A different picture might appear when it comes to short-rotation plantations where trees are plated and removed at high frequency anyway and where non-indigenous variations could play an

important role for more flexibility. It is not just by coincidence that the latter practice does resemble agriculture much more than traditional and modern forestry.

Contrasting or combining wild woods, extensive forestry and intensive short rotation

Taking into account the manifold demands for functions of forests, a somewhat segregating strategy is necessary to combine wild woods, extensive forestry and intensive short rotation plantations. The quantitative proportions are debateable. Focussing on forests as greenhouse gas sinks, however, one would prefer a large proportion of wild or extensively used forests with a high amount of (non-harvested) biomass, here combining mitigation and biodiversity protection. This will however, demand for short rotation plantation elsewhere. Here, the resulting strategy might be not to use forest areas but agricultural or ruderal areas for such plantations. As a consequence, good change would imply to blur the traditional and culturally quite sharp (European) distinction between field and forest for biomass grown in short rotation. However, in detail it will have to sorted out whether this will also continue in new ways old practices of short ('Niederwald') and midterm ('Mittelwald') rotation practices in combination with extensive use of husbandry. Another very important point from a global perspective is a halt to cut forests in the tropics for agricultural purposes including all sorts of tree plantations for fuel since the gains in food, fibre and fuel do not outweigh biodiversity and ecosystem functions (Foley *et al*., 2011). In sum, the total amount of forested area may not be diminished elsewhere, too.

A hierarchy of goals for using forest products?

The question of a hierarchy for forest products cannot be answered without taking into account the needs and preferences of local communities, as several of the aforementioned UN documents explicitly state. It seems that all sorts of ecosystem services, including CO_2-fixation for climate change mitigation as well as adaptation. And again, for reasons mentioned above, the use of wood or tree products primarily for fuel will have to decrease, by replacing small fireplaces by solar energy and by replacing tree plantations for conversion into agro-fuel by structured forests for multiple uses. Notwithstanding, wood for fuel from side-products of logging and the sawmills of course does make very much sense anyway.

But is a forest only the sum of its resource and ecosystem functions? There is more to the 'good change' perspective. It shall serve as a somewhat neglected part of the much more encompassing notion of sustainable development. For example perspectives on biodiversity have to go beyond instrumental expressions of ecosystem services and other functional approaches – and this is not at all a specific German perspective on forests and sustainability (Grober, 2010; Leopold, 1953). It shall take seriously the dynamic perspective of natural and cultural processes, also regarding the too sharp distinction between forestry and agriculture, and a revised notion of what naturalness or integrity might mean. 'Good change' shall be part of ethically sound decisions about which measures are to be taken against undesirable developments and how to act in favour of desirable change.

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Section 6. Environmental & agricultural ethics

A collective virtue approach to agricultural ethics

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Abstract

This paper aims to develop a collective virtue approach to agricultural ethics, building on a critical assessment of the agrarian tradition. It is argued that agriculture provides examples where the collective virtues approach is particularly attractive. For such virtues to be applicable, the entities to which they are ascribed need to satisfy certain conditions so that they can be regarded as conglomerates. Furthermore, a collective virtue ethics approach in agriculture could be compatible with both Aristotelian (teleological) accounts of virtues and non-teleological (e.g. sentimentalist) ones, and with different forms of organizing agricultural production.

Keywords: virtue ethics, agrarianism, agriculture, group virtue

Introduction

In the last decades, there has been an increased interest in virtue ethics, both in normative ethics (e.g. Hursthouse, 1999) and applied ethics (e.g. Oakley and Cocking, 2001).

In the field of environmental ethics – which I here take to be a sub-field of applied ethics – writers like Philip Cafaro, Ronald Sandler, and Louke van Wensveen have developed virtue ethical approaches to the environment, including arguments for specific environmental virtues like frugality (Van Wensveen 2001:227) and characterization of specific environmental vices like gluttony and arrogance (Cafaro, 2005).

There are different varieties of virtue ethics – some are eudemonistic in the vein of Aristotle, some not. All varieties, however, are alike in focussing on the agent and the agent's character rather than on the evaluation of individual acts, whether act tokens or act types.

A potential general problem with virtue ethics, which it admittedly might share to some extent with deontological and consequentialist approaches, is its emphasis on individuals. But environmental problems are not necessarily the result of deficiencies in the characters of individual humans, nor are they necessarily best dealt with through improvement of individuals' character. Rather, at least some environmental problems, for instance those relating to over-use of land, water and other resources for agriculture, might be caused in part by coordination problems (such as Prisoners' Dilemmas) or the organization of political systems. This has led some virtue ethicist to emphasize 'public virtues' (Treanor, 2010). Such virtues are 'character traits that bring us into virtuous relationships with our communities and environments' (*ibid*. 18). Such approaches are of course not unknown in virtue ethics.

Agrarianism

Agrarianism is tightly connected with virtue ethics, tough not a systematic philosophy. A recent encyclopedia entry claims that 'the heart of agrarianism as an ethics may be viewed as a virtue ethics, focusing on the habits of character that produce virtuous persons' (Hilde, 2009). Its origins are most frequently associated with Thomas Jefferson (the third president of the United States and main author of the US Declaration of Independence), in whose oft-cited and probably oft-misinterpreted words (Thompson, 2010): 'Cultivators of the earth are the most valuable citizens. They are the most vigorous,

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the most independent, the most virtuous, & they are tied to their country & wedded to its liberty & interests by the most lasting bonds'. The central idea here, taken up by modern agrarians (*ibid.*), is that farmers make the best citizens, and furthermore the related idea that an agriculturally based economy provides the best basis for organization of society. An agriculturally based economy is usually thought of as being made up of small scale landowner-producers (for instance in the form of family-run farms). Agrarians are generally sceptical to industrial agriculture. In Paul B. Thompsons words, industrial agriculture 'embodies a form of cultural and political one-dimensionality that crushes human creativity and promotes an unsatisfying portrayal of human potential, social purpose, and the natural world' (Thompson, 2010: 60). In the agrarian tradition, some virtues are seen as being characteristic of (non-industrial) agriculture.

Still, agrarians and community-oriented environmental virtue ethicists such as Treanor (2010) think of virtues as being properties of individual, human, agents. It is possible to approach the issue in a different way – by ascribing virtues to collective entities such as groups of people, at least if those groups satisfy certain conditions (Beggs, 2003, cf. Arjoon, 2000). Or so I will argue.

Collective virtues of agriculture

For the purposes of this presentation, I will start with a characterization of virtues adapted from Philippa Foot's (1997), 'Virtues and vices' with virtues understood as characteristics of an agent, including but not limited to dispositions to act, which (a) are beneficial to the agent itself and to moral patients; (b) engage the will and are thus distinct from skills; and (c) are corrective (Sandin, 2007). It should be noted that this characterization is neutral between Aristotelian (teleological or eudaimonistic account of virtues as conducive to flourishing, and non-teleological (e.g. sentimentalist) interpretations.

What needs to be proved, however, is that such characteristics, i.e. virtues, are ascribable also to some collective entities. Building on previous work (Sandin, 2007), I argue that there are at least four plausible arguments in favour of this claim: The *linguistic argument* (we talk as if there are collective virtues), the *stability argument* (some collectives are behaviourally more stable than individuals), the related *capability argument* (that some collectives are more capable of virtue than individuals are) and finally the *pragmatic argument* (ascription of collective virtue can be useful).

This discussion parallels discussions about collective and corporate responsibility (Moore, 1999). Drawing on that discussion I tentatively suggest that in order to be a candidate for ascription of collective virtue, a collective needs to be a conglomerate rather than a merely coincidental collection of individuals (an aggregate). Conglomerates (1) have internal organisations or decision procedures for choosing courses of action; (2) enforce codes of conduct for its individual members, different from those applicable in larger communities; and (3) have members filling certain roles, with certain powers over other members, while being replaceable without an ensuing change in the identity of the conglomerate (French, 1984: 13f). The last point means that if for instance a family-run farm is a conglomerate, it would still be the same farm even though some or even all members have been replaced. (It should be noted that the continued existence of a conglomerate in this case is not necessarily dependent on biological bonds.)

As has often been observed, agriculture differs from many other productive activities through being bound to a particular place in a way which, for instance, industrial production of other goods and, to an even greater extent, services, typically are not. It is also obvious that given the different conditions of agriculture in different parts of the world and in different times, forms of organization of agriculture vary very considerably. The virtues of present-day European mixed farming are likely to differ from the virtues of 19th century 'frontier' agriculture, to mention but one example. This is of course the

case today as well. Agriculture is necessarily variable between different climates, soil conditions, social structure, and so on. Agriculture cannot be exactly the same in Northern Sweden as in New South Wales, Australia, for instance. The collective virtue approach to agriculture must accommodate this. It should be compatible with a variety of ways of doing agriculture; just as professional virtue ethics should be able to accommodate different professions and professional roles (Oakley and Cocking, 2001). At the same time, however, it cannot be the case that ascription of collective virtue should be possible for all possible forms of agricultural production – this would lead to problems similar to the paradox of the courageous villain. For instance, it would be strange to ascribe collective virtue to entities involved in an obviously unsustainable form of agriculture.

I argue that the agrarian tradition (e.g. as developed by Thompson, 2010) contains elements that might be developed not only along individual virtue ethical lines, but also collective virtue ethical ones, that involve sustainability as an essential part.

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Providing grounds for agricultural ethics: the wider philosophical significance of plant life integrity

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Abstract

Growing and breeding plants is pivotal to agriculture including also animal keeping. To understand what agricultural ethics implies, the significance of plant life ought to be given new attention. So far, little literature has been devoted to plant ethics and granting a moral standing to plants remains a difficult endeavour at this stage. One difficulty may be that, due to the unification of biology as a scientific discipline based on the theory of evolution, plants are granted the same theoretical standing as animals. Yet, for common sense plants and animals belong to different fields of perception and experience, a difference that used to be captured by the notion of kingdom. To make sense of common sense, a framework inspired by pragmatism and aesthetics is used to assess on novel grounds the specificity of plants. By considering morphogenetic forces embodied in biophysical forms and organic performances, it is shown that plants exhibit completely original features that make them incommensurable with animals. Because of their unique ontology, plants appear to be 'non-*topos*', i.e. non-centred, unlimited, indeterminate, unsplit (having neither inside nor outside) entities. They are, along with algae, the only living beings able to directly convert sun energy into chemical energy and store it within organic matter. This matter does not represent food but their very body gradually coming to existence. Hence, although this may sound quite thought provoking, one has to realise that plant physical integrity actually encompasses soil, environment, living beings, and the cosmos. Here, the notion of integrity proves especially interesting because it captures both descriptive and normative contents. Because of their – literally – outstanding nature, plants require a completely new ethical approach. It is proposed that this is embedded to some degree in organic agriculture and agroecology. Indeed, the emergence of organic agriculture about a century ago was prompted by the advent of chemical fertilizers that caused disruption of crop life integrity at soil level. This emergence was not only an implicit call to respect plant life integrity but also a first step towards a comprehensive philosophy of agriculture, a philosophy that is clearly centred on the fertilisation of the world by plants. The recent development of farm seed and participatory plant breeding networks might represent a second step in the mental revolution that brings the plant, besides land and soil, to the forefront of agricultural concerns.

Keywords: 'non-*topos*', organic agriculture, ontogenetic performance, plant kingdom, theoretical standing

Introduction

The choices made for plant domestication have definitely changed the face of the world and led to wide adoption of steppic, i.e. open-field, agroecosystems. Agriculture is primarily about growing and breeding plants. Of course, animal breeding also plays an important role in agriculture but the development of communities based only on animal keeping cannot outrun the capacity of natural ecosystems and is thus intrinsically limited. In contrast, plant mastery allows transgression of ecosystemic capacities because it involves the harnessing of solar power via photosynthesis. Through crop production it is possible to scale up the total energy available for both humans and animals. This allows enormous increases in population sizes and urban areas in the world, as observed during the last two or three centuries. At the same time this also leads to enormous environmental damage.

There may be various reasons for addressing the issue of plant ethics. But if one agrees that in the first place most major ecosystemic changes have been caused by the advent of agriculture, one has to conclude that at least for this reason the significance of plant life ought to be given new attention. Whilst plant life is a most obvious component of everyday life and has been extensively studied by plant biologists, there is currently little literature devoted to plant ethics. This paper explores why the significance of plant life defies a solely atomistic perspective and requires a specific approach that differs radically from common approaches used for animals. By considering the wider ontological nature of plants, this paper then examines how the ethical issue has to be re-defined on novel grounds and how it finally merges with the agricultural issue as a whole (for further details, see Pouteau, 2011).

A strange evidence: a plant is not an animal

The issue of plant ethics hangs far behind animal ethics and granting a moral status to plants remains a difficult endeavour at this stage. One may assume that this is due to a lack of obvious moral intuitions but such an assumption would deserve further anthropological and sociological scrutiny. Alternatively, it is possible that the issue has not yet been addressed in adequate terms, in which case it first needs to acquire a proper philosophical standing. So far, there has been one major exception to the lack of interest in plant ethics. This is due to an article in the Swiss Constitution which stipulates that 'the dignity of creatures' should be considered in the case of animal, plant and microorganism life. Since the first adoption of this article by a referendum in 1992, a number of attempts have been made to examine what the dignity of plants could signify and how to deal with it. In 2008 the publication of a report on this subject by the Federal Ethics Committee on Non-Human Biotechnology (ECNH) was awarded a peace Ig Nobel prize, an American parody of the Nobel Prizes that celebrates improbable research. One feature of the humorous notes that bloomed on the internet was an animalisation or personification of plants (e.g. 'the silent scream of the asparagus' or 'the silent sobbing of the salad'). In other words, granting plants a moral standing was equated with plants being treated as animals (or human beings).

The Swiss experience is especially instructive because it launches the plant ethics issue in the public arena and leads to identifying a check-point that had been overlooked so far, i.e. the discrepancy between the theoretical standing of plants and common sense. The establishment of a plant science in the eighteenth century was achieved through granting plants the same theoretical standing as animals (Delaporte, 1979). This standing has been further enforced by the unification of biology as a scientific discipline based on the theory of evolution. Plants belong to the community of living beings: they share a common ancestor with animals and are made of the same components, e.g. cells and genes. Yet, for common sense plants and animals belong to different fields of perception and experience, a difference that used to be conveyed by the notion of 'kingdom'. In this context, the animal seems to stand more as a theoretical block than a reference for a moral consideration of plants (Pouteau, 2011; unpublished data). By considering that common sense captures wider significations than scientific analysis alone, it is concluded that in order to make sense of common sense the statement 'a plant is not an animal' needs to be thoroughly assessed. To this end, it is important to question what makes plants obvious and mysterious at the same time and to develop a hermeneutics of plant specific ontology.

On what it means to be a plant: a 'plastician' approach

So far, plant sensitivity and ethology remain subject to debate (ECNH, 2008). In any case, the debate itself may be misleading since it lends support to the preconceived view that a moral standing for plants should be theoretically referred to the animal. Yet, to value something on the basis of external references represents a form of fetishism. In other words, the granting of a moral standing needs to be defended by means of internal references. This means that it is crucial to assess what makes plants radically and unconditionally different from animals. Analytical comparisons that establish a theoretical continuum

between different living beings, and also between matter and living beings, can only support a nominal notion of kingdom. If one has in view a realist approach of the plant kingdom, then global, systemic descriptions anchored in concrete perception and experience need to be considered.

According to Pierre Hadot (2004), Johann Wolfgang von Goethe's scientific approach, captured by his statement that 'nature is mysterious in the light of day', represented a radical transformation of the notion of nature's secret. Nature is mysterious because it does not hide and exhibits its secrets in any of its productions. In other words, every form is performed and brings formative forces on display. To some degree, Jacob von Uexküll (1934) reached a similar conclusion when he considered that organic significations are embedded in performances. But von Uexküll's main interest was in animal performances and these are to a large extent behavioural. In contrast, Goethe's most important contribution to biology was in the field of plant morphogenesis where performances are mainly ontogenetic and unceasingly registered in plant bodily features (Goethe, 1790). To address plant significations, one does not need to speculate on putative plant purposes and teleological interests but can rather consider that these significations (information) are embodied in morphogenetic performances. This interpretation has provided the basis for a descriptive, 'plastician' approach that draws on pragmatism and aesthetics by combining experimental botany, developmental biology and biophysics of morphogenesis (Pouteau, 2011; unpublished data).

Describing plant life integrity: a 'realist' assessment

The hermeneutic approach adopted may be described as a 'new realism'. It provides grounds to voice a fact that is usually overlooked because it is so obvious: plants override the limits of purely newtonian objects and possess a more complex ontology. To be a non-newtonian entity, i.e. more than an object only submitted to external forces, one does not need to be granted reason or sensitivity, or life. From a pragmatic perspective, one only has to express an ontology that is consubstantial with others and embark these others with it through its own history. This is probably true of any entity in the world. But more than any other entity, the plant exhibits in a radical way its mundane, existential belonging through all its most concrete properties.

Plants are non-centred, unlimited, indeterminate, unsplit (having neither inside nor outside) entities. They are, along with algae, the only living beings able to capture sun energy and to convert it to chemical energy, which is stored within organic matter via carbon dioxide assimilation (Gest, 2002). This matter is in no way analogous to food for animals: it is the very plant being coming to existence and shaping itself. This gradual embodying is a form of embryogenesis that takes place in the open world. It is highly contingent on environmental conditions (a property called phenotypic plasticity) and also concomitant with continuous decaying and passing over of plant body parts. Altogether, it may be concluded that plants exhibit completely original features that make them incommensurable with animals. Whilst the animal fits the definition of a *topos*, the plant sketches a counter-image that qualifies as a non-*topos*, i.e. a 'proliferous, non-centred open-endedness' (Pouteau, 2011; unpublished data).

Here, the notion of integrity appears especially interesting for at least two reasons. First, it incorporates both descriptive and normative contents and lends support to the pragmatic notion (and aesthetic experience) that ethical evaluations and positive (f)acts are constitutively intertwined (Hache and Latour, 2009). Second, it refers to completeness, besides other descriptive properties such as wholeness and coherence. Completeness usually seems to be a bottom line for the definition of integrity but here it proves especially suited to elaborate on the specificity of plants. Because of their indeterminate ontology, plant entities do not have clear spatial and temporal boundaries and can never be conceived as complete. Hence, plant physical integrity necessarily encompasses also soil, environment, different

kinds of living beings including humans, and the cosmos (at least the sun). Once this wider ontological nature of plants is recognised, the ethical issue also changes radically.

Respecting plant life integrity: an agricultural issue?

Plant conservation policy for the protection of biodiversity is but one aspect of plant ethical issues. Because of their – literally – outstanding nature, plants require a completely new ethical approach that needs to incorporate an ecosystemic evaluation process. Plants may 'suffer' from any change in their local and global environment even if they are not directly affected by partial or total destruction. The notion of plant life integrity points to the agricultural issue as a whole, i.e. crop culture itself but also all activities allowed by the mastery of sun energy, e.g. massive urban development, deforestation, animal rearing, tourism, etc. This global issue may be covered to some extent by ecocentrism, a field of environmental philosophy that builds up on ecosystemic and holistic premices (Rolston III, 1994; Callicot, 1995). Yet, too often it is assumed that agriculture is but a degraded state of nature and this tends to hide the fact that most fundamental environmental issues arise from choices that were made primarily for and by agriculture. These choices include the plant species bred for food and their specific ecosystems, the way these species are bred and modelled to fit human needs (or greed), and the practices used to grow, harvest, store and distribute plant productions.

In the first place, world-wide adoption of cereals and other crops relying on high-light input in open fields has had tremendous impacts on ecosystem and climate transformations. These impacts have risen in intensity after the advent of chemical fertilizers about a century ago. This advent may be equated with 'soil-free' culture since it allows to partially bypass a major regulatory feed-back of carbon fixation *via* nitrogen availability and to uncouple the harnessing of sun power from soil and environment self-regulation capacities. 'Soil-free' culture meant a disruption of crop life integrity at soil level and eventually affected the whole of plant life. As in a vicious circle, metabolic and morphogenetic disorders – a form of obesity – arose and called for more chemical inputs (stalk-shorteners and various sorts of pesticides). At the same time, the industrial investment in breeding crops able to sustain the race for excellence gradually imposed a block at the level of seed dissemination by the enforcement of property rights and this further disrupted plants ability to circulate seeds through environmental and cultural means (Pimbert, 2011).

Once the wider significance of 'soil-free' culture is recognised, the emergence of organic agriculture after World War I appears in a new light as a response to the dismantling of plant life integrity. Organic agriculture provided a first articulate discourse in environmental ethics although this remained mostly outside academic concerns (see below). In contrast to the field of environmental ethics that arose mainly in Northern America in the 1970s, organic agriculture was born in Europe, a world area with a long past agricultural history. Its primary concern was not wilderness and a quest for pristine nature as in the New World but soil fertility, i.e. restoring and invigorating plant life integrity at soil level. An emblematic illustration of this was the creation of the Soil Association in the United Kingdom in 1946. During the last decade, less than a century later, an even more important issue related to the free access to seed stocks has been taking off and participatory plant breeding social networks have started to flourish in France and other countries (Pimbert, 2011). The chief concern is not only soil anymore, but clearly also the plant itself and the way it centralises the various issues for an ecologically and socially respectful agriculture (Anonymous, 2011). In turn, the issue of plant ethics sheds new light on the wider significance of organic agriculture.

On the virtue of crisis: the emergence of agricultural philosophy and ethics

One may wonder why academic institutions have quite overtly ignored organic agriculture for a large part of the twentieth century. The situation might have been more or less radical in different European countries. Yet, apart from technical issues, it seems that the wider philosophical implications of organic agriculture (and more recently agroecology) movements has been largely overlooked. One explanation may be that agriculture as a whole lacks firm philosophical grounds. Hub Zwart (2009) recalls that ancient Greek (and Chinese) philosophy was little concerned by the worries of mundane and daily life and that the practical nature of farmers' knowledge never became a subject for philosophical thought. Only the contemplative issue of temperance with respect to food consumption received attention but agricultural activity in itself never reached a philosophical standing. In this context, the claim for an articulate discourse by the founders of organic farming (e.g. Rudolf Steiner and Albert Howard) and their followers could only be interpreted as mere nonsense and a jumble of unscientific, animistic and ideological slogans with no sound cognitive basis. As a matter of fact, organic agriculture elaborated on a philosophy that was never born and hence could not be defended by philosophical means (Besson, 2009).

In such a context, recognition had to come first from social grounds. In spite of widespread distrust and lack of political support, organic agriculture has gradually attracted more interest in society and it is now one debated factor in prospectives for a sustainable agriculture. To appreciate the significance of this evolution, it is important to re-consider what happened in the initial steps after World War I. The first meaning of *crisis* in ancient Greek was judgement or decision. Other meanings were choice, debate and, of course, crisis or happening. Crisis is an event in a radical sense. It is not only a challenge but also an opportunity to question what used to be obvious or even unspoken and to bring philosophical thought in what had never received a cognitive standing. The invention of 'soil-less' culture was an event in that it meant a dualistic fission in the remains of the ancient vision of nature as a life circle or wheel. Most strikingly, the plant suddenly appeared split up into a linear chain of production with external(ised) inputs and outputs, just like a car factory. This event not only disintegrated the integrity of one entity of the natural world but, because of the plant constitutively unsplit nature, it also affected the entire course of the world.

To depict this event as a major departure from natural and social life integrity implied a judgement, a debate and a choice. It was a happening in that it brought philosophical and scientific thought into what used to be a mythic narrative of the origins and a social *ethos*. For the first time, philosophical and ethical thought was conveyed into the organic activities of agriculture. The emergence of organic agriculture was not only an implicit call to respect plant life integrity but also a first step towards a comprehensive philosophy of agriculture. This philosophy is clearly centred on the fertilisation of the world by plants. It is part of a global anthropological project that is closely linked to 'our agricultural fate'. In other words, the birth of organic agriculture may be seen as the foundation of a philosophy of agriculture, an event that started no less than 2,500 years after the invention of philosophy and 10,000 years after the original act of agricultural foundation! The creation of farm seed networks might represent an even more radical step toward a comprehensive vision of agriculture in that it points quite clearly to the central role of plants in this happening (Anonymous, 2011). Finally, history seems to be making a feed-back loop: plant domestication was the foundation act of agriculture and moral consideration of plants is now making this (unconscious or intuitive) foundation act a matter of cognitive, conscious comprehensiveness. For this reason, it is proposed that, as a mirror image, the moral consideration of plants may involve a mental revolution potentially as paramount as the 'Neolithic revolution', i.e. the origin of agriculture in the words of Vere Gordon Childe.

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Do algae have moral standing? On exploitation, ethical extension and climate change mitigation

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Abstract

Because global climate change is closely connected to the consumption of fossil fuels on which the western way of life is based, we experience the thought of changing our behaviour to mitigate climate change as a moral dilemma. Therefore, our hopes are on a 'technological fix', which appears to evade tricky moral questions by finding a clean source of energy. This paper explores moral issues underneath the unproblematic appearance of this turn by looking into the relations between technological fixes, exploitation, and ethical extension. With the advent of fossil fuels in the late 19th and 20th century, the labour needed to provide the beneficiaries of the economy with goods largely shifted from the proletariat to the 'nature worker', the natural inputs which are consumed with the production of goods. This shift led to the emancipation of the proletariat, but it turned out to be at the expense of the global ecosystem. We now try to find a more sustainable nature-worker in order to unburden the ecosystem and avert a climate crisis. This framing sheds new insight in the dynamics of ethical extension. While ethical extension is typically understood as an intellectual development, the ideas of moral considerability appear to co-evolve with technological development and the negative side-effects of exploitation. The extension of the moral community tends to coincide with the exploitation of a new object. This will in time lead to new issues which are only solvable by finding yet another object to exploit. This perspective leads us to conclude that while technological fixes appear to evade moral dilemmas, they merely shift them to another level. If we mitigate climate change by rebuilding the economy around highly efficient algae to produce fuel and base materials, we ought to look into the issues that may be on the horizon.

Keywords: moral community, moral objects, biotechnology, exploitation

Introduction

Despite sustained calls for action by scientists and environmentalists on curbing anthropogenic climate change, real progress on reducing our carbon footprints seems nonexistent (IPCC, 2007; Druckman and Jackson, 2009). A common explanation for the apparent inability to deal with this problem is that it involves complex global and intergenerational moral issues, combined with scientific uncertainty (Gardiner, 2006), but at its basis is a much simpler issue: our activities have negative side-effects. If we had not built our entire economy and culture around the abundant use of fossil fuels, it would have been much easier to abstain from its use. Now we experience a moral dilemma when we have to choose between giving up some personal comfort and putting the global climate at risk.

The most popular way out of this dilemma is the technological fix. If we find a new way to produce energy, or if we design our technologies in such a way that they are much more efficient, we can keep living our lives the way we are used to, just without the negative side-effects. If we compare this prospect with the alternative of the 'behavioural fix' of frugal living and relinquishing former attainments, the popular hope on novel technologies should not be surprising. Biotechnology is one of these great hopes for humanity: with the help of genomics and related fields, we may for example be able to develop algae which efficiently transform sunlight into usable energy and materials (Wijffels and Barbosa, 2010).

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But what happens if we find such a new technology? Are we allowed to use algae to mitigate climate change? Or do we need to consider the moral rights of algae? Should algae have moral standing?

Although it appears that complex moral questions are evaded when we turn to technological solutions for our moral problems, this paper explores the moral dimensions of this turn by looking at the interaction between technological development, exploitation, and ethical extension.

Exploitation of the nature-worker

Before the industrial revolution, the wealth of the few was based on the work of the many. Most people lived at subsistence levels with large families in small homes. With the advent of fossil fuels in the late 19th and 20th century, this changed: now the wealth of the many is to a large extent based on the work of earthly mineral deposits. With the help of oil, today's consumer society provides an enormous amount of people with goods that go well beyond their basic needs. This wealth does not simply emerge from the free market, as mainstream economists like to have it, but somewhere, something is doing the work. This 'something' is what Peter Sloterdijk (2007) calls the 'nature-worker': the natural resources that are consumed with the production of goods and services. The nature-worker is different from 'natural capital', which, when treated properly, will remain intact with its use. Like traditional labour, the labour done by the nature-worker cannot be recovered from the produced goods.

The use of the nature-worker has long been mostly invisible because it appeared unproblematic, but in the last few decades it gradually became clear that there is a limit to the amount of fossil fuel there is to consume, and to the capacity of the atmosphere to function as a sink for the by-products of this consumption. Now we are finding its limits, the nature-worker becomes visible as a possible bottleneck to further economic development. Framed this way, sustainable energy production is an attempt to shift from the 'fossil' nature-worker to the more permanent 'solar' nature-worker. We are currently unable to see how this might be problematic in the future, but we are able to recognise the analogy with the earlier shift of workload from labour to the nature-worker. It is therefore worthwhile to explore this analogy, and find out whether the difficulties we run into now are simply a case of bad luck because we picked the wrong type of nature-worker, or intrinsic to the process of finding new sources of labour when the old ones become problematic.

The shift of workload from the human worker to the nature-worker marks the end, or at least a reduction, of the exploitation of the workforce. This is not to claim that no human labourer is exploited anymore, but mechanised production enabled the work force to move from being the driving force behind the economy, to its beneficiary. But does this mean that less exploitation occurred? Or could we say that humanity started exploiting the nature-worker?

The concept of exploitation is not well defined, but broadly, it is suggested that 'one party exploits another when it gets unfair and undeserved benefits from its transactions or relationships' (Wertheimer, 2008). Disputes may arise over the question what would be unfair or undeserved, and what could count as a 'party'. Without getting into technical details, it is reasonable to hold that in order to be exploited, a party must be granted a degree of moral considerability – it does not make sense to speak of fairness or desert outside of the realm of morality. What counts as a party thus depends on the boundaries of the moral community. At the same time, exploitation is the result of a lack of moral consideration: in Kantian terms the exploit*er* uses the exploit*ee* as a means rather than as an end in itself. The exploited finds itself in a grey area of the moral community: it is granted a theoretical moral considerability, but is not treated as such in practice.

So, claiming that we are exploiting the nature-worker implies that we ascribe some kind of moral considerability to it, but do not treat it as such. Let us accept this hypothesis for now, and take a closer look at the way we tend to extend the moral community.

Ethical extension

The moral community is the range of objects protected by ethical considerations. Originally consisting of only male citizens of ancient Greek city-states, it gradually extended to include slaves, workers, women, and foreigners. These first steps of extension were symmetrical – only *subjects* capable of moral *responsibility* were eligible as *objects* for moral *consideration*. More recently, a distinction has been made between moral responsibility and moral considerability, allowing for the protection of for example infants and mentally disabled people. This also opened the door towards moral consideration for other sentient beings, like (higher) animals, and all living beings (Alrøe and Kristensen, 2003; Nash, 1989).

With the development of the science of ecology, a new understanding of the connections between individuals and their environment emerged. When ecology is taken seriously, it turns out to be impossible to find a boundary between individual organisms and the environment they live in. This led Aldo Leopold to conclude that 'A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends to do otherwise' (Leopold, 1949: 224-225). This route opens up the possibility to ascribe moral considerability to *systems* rather than individuals, like the atmosphere or a specific ecosystem. The family and the nation as moral objects could be understood as precursors to these ecological systems. Although not free from philosophical difficulties, frameworks for systemic ethics which allow for the moral consideration of the ecosystem are being developed (Alrøe and Kristensen, 2003).

The development of ethical extension is typically understood as the development of ideas – new insights in politics or science lead to the inclusion of new categories of moral objects, increasingly dissimilar from the self (Nash, 1989). A visual interpretation of this idea is provided in Figure 1, in which it must be noted that the order of objects is flexible to a certain extent – we might choose to consider race before nation, or rocks only after ecosystems. Obviously, the far end of this graph is rather speculative – from the perspective of today it appears to be unlikely that one day humanity will consider the entire universe as a moral object.

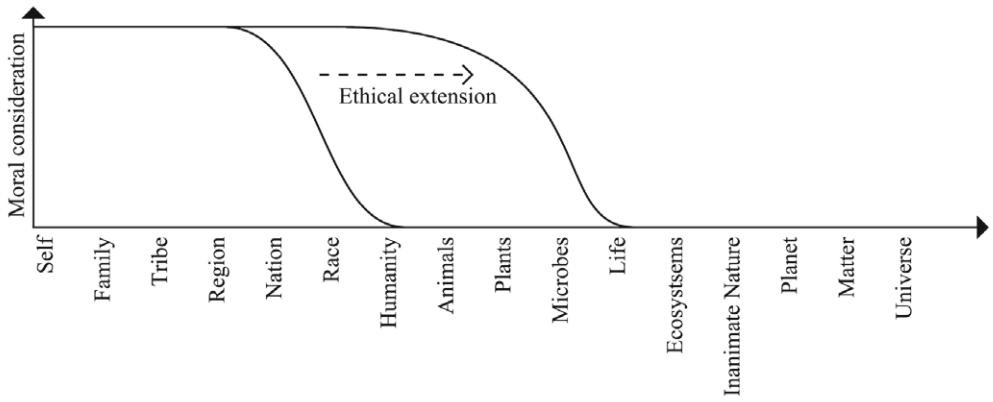

Figure 1. Traditional understanding of ethical extension.

Although this development of ideas is certainly important, it cannot be the entire story, as it fails to account for the 'grey zone' of exploitation that is described above. Therefore we propose to supplement this model with the dimension of exploitation.

Before the exploitation of the work force came to an end with the shift towards the nature-worker, it first became particularly severe. Industrial production methods led to the creation of the proletariat: factory workers earning just enough to live, but not enough to get ahead and improve their livelihood. Large parts of society were exploited in what is sometimes called 'wage slavery'. Although many left the countryside hoping to find a better life in the city, they typically saw their quality of life reduced as the rhythm of the factories started controlling their lives. Only after several decades, workers were slowly but surely granted more rights: shorter working weeks, the abolition of child labour, higher wages which opened up a greater market, etc. (Hopkins, 1982). This shift coincided with the sophistication of industrial technology: from coal-fired steam engines to electric power and automation. These innovations radically reduced the amount of manual labour in factories by shifting the workload to the nature-worker.

If we accept that the exploitation of the workforce in the earlier years of the industrial age was a sign of a lack of moral consideration for the poor, we see that moral consideration coincided with new technological developments and a new economic model, revolving around increasing consumption for most of humanity. The work force moved from being the driving force behind the economy to its beneficiary, while the nature-worker was opened up as new provider of labour. Framed this way, the exploitation of the nature-worker appears to have been essential for the moral consideration of the previous exploitee, the proletariat. Now the use of the fossil nature-worker becomes problematic because it turns out to entail the exploitation of the ecosystem, we attempt to open up the solar nature-worker in order to unburden the global ecosystem.

Ethical extension is thus no process in which the category of moral objects is simply expanded with the advance of ideas, but one in which moral consideration of an object coincides with the exploitation of a new one. Figure 2 is an attempt to capture this idea in a graph – the entire curve slowly moves to the right, a 'trough' of exploitation precedes moral consideration. Again, it should be emphasised that the order of objects is flexible. If we manage to unburden the global ecosystem, we might grow more dependent on plants, making moral consideration for all life a more distant ideal.

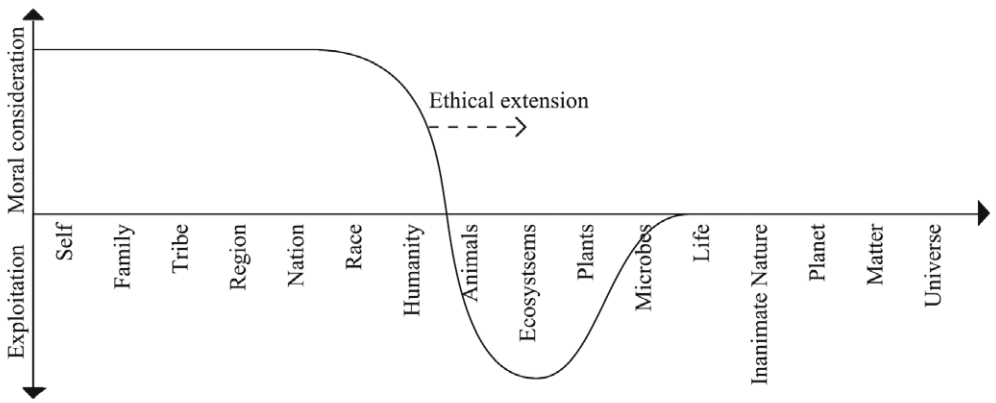

Figure 2. Exploitation preceding moral consideration.

Understood this way, ethical extension is the product of the development of ideas on moral considerability, (technological) developments opening up new possible exploitees, and the issues that result from the exploitation of a party. The exact dynamics between these forces are still vague, but we propose they could be understood as co-evolving. Currently we are seeing technological developments in response to the issue of climate change, as well as a renewed philosophical interest in the 'rights of nature' and the moral considerability of ecosystems, but there is no reason to assume that the by-products of exploitation are always pushing the other two forces.

This is not to say that we should stop accepting any extension of moral considerability, but we should be aware that somewhere, something pays the price.

Unburdening the climate – postponing the crisis?

Back to the technological fix for the climate crisis – what exactly is the problem? By shifting from the fossil to the solar nature-worker, we open up a new source of wealth, which allows us to unburden the climate. The crisis is averted for now, at the expense of the solar nature-worker. One of these novel nature-workers might be microbial life. Already, many pharmaceuticals are produced by (partly genetically modified) yeasts and bacteria, as well as foodstuffs like yoghurt and cheese. With an increasing knowledge of genomics, systems biology, and synthetic biology, many new fields of application are emerging (Carlson, 2010). One of these is the usage of photosynthetic cyanobacteria and algae in order to efficiently produce bio fuels, without using fertile farmland or fresh water (Wijffels and Barbosa, 2010). Algae can produce oil and proteins vastly more efficiently than current crops, and engineered microbes will be able to produce any foodstuff, medicine, or industrial base material imaginable.

There are good reasons to claim that algae will be used in a way that goes against their nature: they will be taken out of their natural habitat and into bioreactors, their genome might be altered, and they will be 'force fed' exactly enough sunshine and carbon dioxide to maximise productivity. But to ascribe a moral value to this situation seems far-fetched at the moment: we do not ascribe moral considerability to algae or other microbes, so they do not have moral standing. This might change in the future – not only via the development of moral philosophy, but also via the as yet unknown side effects of the employment of large-scale solar nature-workers. Like in the case with fossil fuels, it might not be the microbes themselves which turn out to be problematic, but something else impacted by their use; engineered microbes could for example form a threat to biodiversity when released in the wild (Kelle, 2007).

Regardless of the specificities of novel technologies, our main point is that while a technological fix may appear as the easy way out of a moral dilemma, it will in time lead to new dilemmas. This is not to argue that past and present shifts in moral community and exploitation are wrong, but some scrutiny of such developments would be in place.

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Animistic pragmatism and native ways of knowing: adaptive strategies for responding to environmental change and overcoming the struggle for food in the Arctic

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Abstract

Future-regarding norms appear to be an essential ingredient in motivating adaptive management strategies in the wake of climate change. These norms have always played a part in the 'ecosophy' or ecological-philosophy of Alaska Native Peoples in the Arctic, such as the Inupiat of Seward Peninsula. This kind of animistic pragmatism reflects 'distributed cognition,' a special source of practical wisdom that spans over thousands of years and which has been instrumental in the Inupiat's struggle to survive and thrive in harsh and evolving environments. Native elders have been the embodiment of trans-generational distributed cognition – collective memory, norms, information, knowledge, technical skills, and experimental adaptive strategies. They are human 'supercomputers,' historical epistemologists and moral philosophers of a sort, who use narrative, a form of moral testimony to help their communities face challenges and seize opportunities in the wake of an ever-changing landscape. Here, I will tease out the nature of this 'ecosophy' in terms of pragmatism and then show why this form of pragmatism is necessary for problematizing multi-scalar, intergenerational, uncertain and complex environmental challenges like climate change. The 'ecosophy' of the Inupiat of Seward Peninsula, offers examples of 'focal practices' which are essential for environmental education. These focal practices instill key virtues, namely, humility, gratitude, self-reliance, attentiveness, responsibility, and responsiveness that are necessary for subsistence living. Through ancient narratives, community dwellers are encouraged to aspire to be good persons and to fulfill their roles as community members. These roles often revolve around the procurement of food in a sustainable way and with due reverence to the agencies of the animals harvested. This variant of pragmatism can provide insights into how the metaphysics of dichotomies may be dismantled in order to promote future regarding norms that are mindful of more eco-centric interactions with nature. Alaska Native ecosophy as animistic pragmatism can challenge the dominant reductive streak in contemporary environmental and food ethics.

Keywords: Alaska Native, pragmatism, animal ethics, environmental ethics, food ethics

Introduction

In Thinking Like a Planet, Norton and Hirsch (forthcoming) offer two novel ideas for moving the discourses regarding environmental philosophy forward, especially as it relates to climate ethics. They contend that in order to develop a more appropriate model of understanding climate change and subsequently discern our responsibilities, we should:

1. Reconsider the 'context of evaluation' for the environmental virtues we hope to promote by modifying our cognitive-cultural model so that we appropriately appreciate the level of spatial and temporal scale we adopt; and
2. Explore further the notion of 'poly-centricity' – where new institutions should base their adaptive strategies on this more nuanced conception of space and time. Here, environmental concerns like climate change must be explored with a diversity of stakeholders

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Norton and Hirsch's suggestion that we pay closer attention to a broader temporal-spatial scale seeks to meet the challenges posed by the current dominant productive-economic narrative that motivates much of current environmental policy. In their paper, Norton and Hirsch describe Aldo Leopold's conceptual transformation after he adopted a different cognitive-cultural model, i.e. one that influenced him to 'think like a mountain.' Here, Leopold shifted his gaze from the mere constituents in an ecosystem to the ecosystem itself, looking more closely at the wider relationships inherent in prompting healthy places vis a vis a different temporal spatial context. In my discussions below, I will highlight that the narratives provided by native elders, such as through the oral stories that can be found among the Inupiat of Seward Peninsula, Alaska can also help us to 'think' in terms of a different spatial-temporal framework. These native elders possess a kind of 'distributed cognition' of the sort that Norton and Hirsch articulate (they cite Hutchins and Klausen, 1996, for example for an explanation of this concept) as influencing Leopold's transformation, for they represent the changing world through thousands of years of collected history.

The status of traditional ecological and local knowledge, a form of animistic pragmatism (it is naturalistic, experimental, non-speciest (to a large extent) and open to revision), is profiled and lauded in Charles Wohlforth's narrative, 'The Inupiaq Supercomputer: What the Whale Hunters Know and Some Scientists Want to Discover' (originally published in 2001; see also Wohlforth, 2004). The excerpt below, at the centerpiece of our discussion, is but one example of how Western scholars are learning from native communities regarding how to respond effectively to the challenges raised by climate change. In the Academy, attitudes towards indigenous knowledge have morphed into appreciation and celebration, and an ever increasing interest to 'reverse engineer the magic' of Native 'ecosophy' and their attendant skills of observation and communication found in oral narratives and cultural traditions.

For my presentation, I will consider a particular moral-philosophical dimension of this 'magic'/ecosophy as a form of 'distributed cognition' and as providing a context of evaluation for virtues and as a means to think through the diversity of institutions needed to respond to the challenges of climate change and food security. In the limited space here, I will offer but a sampling of a larger work that will be presented in Tubingen. I will employ the view of animal agency in the Inupiat community of Seward Peninsula as a way to highlight Alaska Native ecosophy, animistic pragmatism, and an adaptive strategy with respect to animals (in some cases as sources of food). The vehicle of narrative embodies the Inupiat representation of the world and their relationship with it. My focus will be on the moral import of narratives as moral testimony in general and I will also highlight the two questions below:

1. What can we learn about moral expertise and the role it plays in the transfer of normative truth or moral knowledge from the Inupiat?
2. What can Inupiaq knowledge or moral testimony teach us in the West, about our responsibilities to the non-human world in a time of climate change in a way that is more practicable?

Animal agency and the Inupiat – a window into Alaska native ecosophy

Second wave philosophical animal ethics, which is ebbing and flowing presently, the variants of which seem sensitive to complex and diverse ways we relate to animals, focuses on the contexts and implications of human-animal relationships as supplements to the inroads made by humane moralists (examples include Midgley, 1983; Rollin, 1995; Thompson, 1993, 2001a,b). While the second wave movement perhaps better articulates how human-animal relationships matter when we consider important questions such as legitimate uses of animals, morally acceptable compromises and promoting human-animal mixed communities that flourish, there has been little attention given to the question of how we talk about animal agency or on behalf of animals. These omissions create an opportunity to learn from many voices the role moral testimony as normative truth telling embedded in storytelling plays in human-animal relationships. To this end, I have chosen to devote some attention to indigenous knowledge, to the

Inupiat (my excerpt below is based on the Inupiat in Barrow), and how they understand moral status of animal agency and how they communicate about the human-animal relationship.

Narrative as moral testimony

Indigenous moral knowledge and knowledge transfer underscore the importance of narrative in our moral deliberations. While steeped in history, narrative (as mirrored in the reservoir of collective wisdom), can encourage moral experimentation in response to an ever-changing world. With one foot in many yesterdays and another stretched to tomorrow, we are forced to constantly be on our toes, to lay dogmatism aside, and to stretch our moral imaginations based on the best evidence and moral reasons we have presently. Narrative as an ethical medium encourages us to focus on building our human character structure to incorporate the virtues that will lead us to value and preserve what we have identified as important (morally and otherwise) for our own sake and others.

Narrative as reflected in the testimonies of elders, for example, play a substantive role in ethics by offering rich biographies and facts, and by drawing audiences to observe carefully and investigate comprehensively both present states of affairs and precedent histories. In light of these features ethicists use narrative to motivate moral examination, explanation and justification. While it can bolster moral weight to rules and principles under debate, narrative also encourages deeper (and different vis a vis analytic means) philosophical inquiry and rumination on the constitutive structures of life itself. Narratives pique our curiosity about the lives of the agents concerned and they can occasion a certain kind of 'living as if' one is the agent in the midst of a moral dilemma and 'living through' her predicament. Narrative when used as a vehicle to persuade us to behave in certain ways can give us assurances that our commitments are the right ones to hold and it can also provide us with justification for our actions (Murray, 1997). Warrant for justification comes from being reliably connected with longstanding foundational stories or mythologies. Foundational stories or mythologies are pervasive cultural snapshots or images of one's cultural tapestry. They provide reliable moral knowledge through precedent histories and time honored problem-solving mechanisms. They are shaped by existential realities and simultaneously they form lucid present day sensibilities. They reflect our moral selves, who we are, the nature and significance of our relationships with others, and how we have assumed our current attitudes and dispositions towards others (Fraser, 2001a,b; Preece and Fraser, 2000).

Moral testimony and expertise: the elder as historical epistemologists and moral philosopher

My particular interest in indigenous moral knowledge as a form of testimony got me thinking about the status of elders as 'experts' for the community. Here, I do not aim to pose necessary and sufficient conditions for who counts as an elder or expert, but merely to raise a substantial account as a matter of philosophical reflection, hoping to shed light on the nature of moral testimony and expertise as such.

While afraid that I may not be doing absolute justice to the notion of an elder, I think the concept of 'expert' applies. Arguably, an elder is someone who possesses a particular kind of expertise. But on what basis is she or he an expert? Is it a matter of content or access to a unique capability? Or both?

A 'respected elder' as expert, as someone who offers consistent example, who reflects by doing the normative truth, arguably must meet the two-fold condition laid out here. She or he is:

1. an historical epistemologist (which presumes deep or significant historical literacy of the culture), and
2. a moral reflector (one who is a moral philosopher of a kind).

Historical literacy and historical epistemologist

To be an historical epistemologist elders must be reservoirs of cultural narrative, to use Wohlforth's term, they must be like 'supercomputers.' As Wohlforth notes about the hunters, they are able to take massive amounts of data and process it like a supercomputer. The slide from historian to epistemologist with a moral flare involves the *process of reflection* on the stockpile of data, much of which will include moral reasons that shape the narratives or is revealed in them. However, we have to be careful regarding how we use 'reflection' here lest we be mocked by these elders. Moral reflection is NOT the ruminating, meditative process we presume in the West. Obviously, Inupiaq people do think about thing, but 'we do not talk like that... we do not think like you do,' was a recent rebuke received. Elders reflect a lot on natural fact and they are valued for their observations and reflections. They are also valued for their ability to apply inherited wisdom that is responsive and apt to a new particular. That is, the valued reflection is the enacted reflection, that is, ancient wisdom in motion to address modern moment, that's what elders do. In this sense then, elders are moral philosophers.

Many elders embody or know the narratives with the intimacy of personal discovery. This intimacy gives them a particular understanding of the moral reasons behind particular normative truths conveyed through these stories. The inherited collective information (Traditional or local knowledge) and the acquired verifications and insights into normative truths allow elders to apply moral reasons to evolving circumstances today.

Moral philosophers and forensic capability

To be a moral philosopher, elders embody a particular kind of forensic skill, namely storytelling or narrative. By reflecting tradition through behavior, moral elders serve as moral compasses for the community. On the one hand, as historical epistemologist, elders have gained 'knowledge of World or Being'. She or he uses this knowledge as the basis for knowledge how and knowledge that. Furthermore, as moral philosopher, the elders can accurately and insightfully reinterpret ancient knowledge of Being into knowledge that can be used in the modern moment. Here, elder as expert is able to masterfully summon narrative to express normative belief and practice. Through narratives native elders not only convey moral knowledge but the narratives themselves, in some way, 'authenticate' the story-teller as an elder/moral expert.

As moral philosopher, a 'respected elder' can employ narrative to persuade by 'presenting a logical explanation, a pathetic proof, and a palpable demonstration of good ethos' (Liszka, 2003: 49, on narratives in general). Elders recognize that narrative is a vehicle for understanding moral truth (it should be noted that in some cases, narratives can also be used to mislead, and the trustworthiness of the informants must be established). The measure of testimony as expressed through narrative is the extent to which it allows the recipients to fair better with the external (especially) impingements that confront them. Narrative can mimic a particularly vivid form of what we can countenance as being true by other, if less memorable means. Narrative can also work as an indispensible means for grasping truths we cannot adequately articulate or would not have discovered by other means, for example, through revelation. Indigenous moral knowledge and knowledge transfer underscore the importance of narrative in our moral deliberations. Thus, as moral philosophers, elders may use narratives as cultural anchors as much as cultural identifiers. Elders use narrative to help recipients explore the proclivities and motivations of the agents or subjects portrayed. Narrative, as a form of moral forensic (as Inupiat elders seem to have found), can promulgate significant moral insights and open new vistas of moral understanding and knowledge (Nussbaum, 1990: 152). For the Inupiat, the possibility of normative truth depends on reaching backwards to move forward. Elders are historical epistemologists and stewards of the instrument of normative knowledge, relying on both collective memory and their powers of reflection, to help thrust the present generation into the future.

In what ways exactly can Inupiat knowledge help us understand human-animal relationships better?

My modest musings about moral testimony above notwithstanding, Inupiaq wisdom has much to offer those in the Academy in terms of a more holistic animal ethics, especially with respect to narrative as a form of moral testimony and to the agency of animals.

On narrative and animal ethics

The starting point for the Inupiat is not to bend the will of the animal to fit their interests or to protect certain human comforts, but rather the acceptance of another being as a form of life to be respected as the kind of being that it is and with whom their lives are complexly and inextricably intertwined in fellowship. There is a sense of providence, as the Inupiat owe their survival to these animals too. While the agency of different species of animals may be celebrated differently, an animal's agency is seen as a matter of fact (upon careful reflection of the order of things).

For the Inupiat, animals are bearers of moral status from the get go. The innate 'powers' of animals serve as central to the Inupiat notion of respect. It is the basis of according the hunted and sacrificed animal the dignity that it is due. The conditions of the human-animal world suggest that the animal be treated with dignity and this is a matter of entitlement per the kind of being the animal is and (as the excerpt above shows), prudence. Thus, the Inupiat approach begins from a morally attuned respect for each form of animal life and shows deference to the human-animal interaction since it ultimately contributes to the flourishing of both human and animal species.

Furthermore, with their emphasis on context and attention to specific details, indigenous moral insights steer audiences away from abstract and empty discourse and opens the promise for all stakeholders to envision workable solutions to real life concerns. For us in the West, Inupiat testimony about animal agency and the close relationship between animal and human being, challenges us to revisit the bases of our human-centricism and consider a broader perspective of how an animal's agency and its welfare are influenced or determined by its location within a complex of human activities. We are challenged to think of ourselves as custodians of animals, but as the excerpt above reminds us, there is a 'wisdom' that animals possess as well. That is, if we do not show proper restraint and continue our exploitative ways, we will be inimically impacted. While animals are 'not our equals,' our fates are intertwined with theirs. We are invited to a morally imaginative re-envisioning of human-animal relations that not only rejects the human-animal distinction based on irrelevant intrinsic properties, but to consider our contingency and solidarity with our 'animal kin.'

Conclusion

We should continue to study indigenous beliefs in and of itself apart from our academic commitment to diversity, so that we may overcome the functional dismissal of indigenous wisdom. As discussed above, a brief but closer look at the Inupiaq world can give us insight into some interesting moral-philosophical questions. We see the requirements of a moral expert in the Inupiaq world (historical epistemologist and philosopher of sorts, employing the forensic skills of story-telling and narrative to convey normative truth). The Inupiaq world illustrates the value of narrative as moral testimony. Perhaps most evident is the Inupiat insistence on the agency of animals. This is clearly not mere anthropomorphism or a 'treat as if' they are (to use the nomenclature of the Academy), 'autonomous subjects.' Instead, the strong belief that the animal makes moral determination is an accepted normative truth. Thus, the animal is due certain respect as expressed through particular actions and attitudes. Thus, community in the Inupiat world is comprised of both animal and human agents. These insights – qualifications of the moral expert,

narrative as moral testimony and animals as interdependent moral agents – are lessons we draw from the Inupiat. Serious consideration of these insights will diversify our Western academic views and surely enhance our relationship with the nonhuman world.

The Inupiat relationship with animals offers us a different paradigm that can help us in the West to transform the ways in which we think of animals, the flora, oceans and atmosphere and to see ourselves as working together with the different agents in our ecosystem to continue to promote its health and viability. This different ways of knowing/ecosophy can help in the development of solutions by suggesting the need for personal and collective action and different public institutions than currently exists perhaps to respond to climate change with a broader spatial-temporal view.

Norton and Hirsh argue that we need a new kind of cognitive cum cultural model of thinking (mental models that express shared values, goals and priorities) in order to appreciate the global nature of our environmental calamity and the nature of our responsibility. The Inupiat of Seward Peninsula offers us a different kind of consciousness that is instructive about how we should relate to the non-human world. The kind of competence that Leopold acquired during his transformation is one that allowed him to see how the different facets of the ecosystem hang together and in effect, the range of duties that must be assumed by the different levels of human institutions. The narratives that are distributed through Inupiat ecosophy (and thus over a lengthy period of ecological time) encourage us to expand our consciousness and not to see Nature and its constituents as merely a productive system or commodities. Being resilient and living sustainably means recognizing the 'functional integrity' of the places where we live. It means putting into place policies in a time of significant environmental challenges that respect the circle and cycle of life that reaches back in time and beyond just the immediate frame. It means appreciating relationships at all levels of human-natural world interactions and *listening* to a diversity of narratives and voices.

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Section 7. Intensive vs. extensive production: animal welfare, efficiency and environmental implications

Sustainability, animal welfare and ethical food policy: a comparative analysis of sustainable intensification and holistic integrative naturalism

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Abstract

In the second half of the twentieth century, agricultural production in the UK intensified, driven first by food security and then economics. Since the 1960s and 1970s both animal welfare and environmental advocates have criticised intensive agriculture. Intensive livestock means confinement, high stocking densities and rapid growth rates, often causing animal suffering. European society demonstrates preference for food from animals reared compassionately in a sustainable way. Livestock agriculture causes 18% of global greenhouse gas emissions, contributing to climate change. Furthermore, the human population is set to reach 9 billion by 2050, meaning greater demand for food, water and energy. In response a UK Government-commissioned report has recommended 'sustainable intensification' of agriculture as a central policy initiative. However, livestock agriculture is a major cause of global warming and intensification might in fact lead to an increase in emissions. This paper proposes an alternative position, holistic integrative naturalism, which argues for more fundamental change in policy prescriptions. These include addressing underlying fundamentals including population growth, excessive consumption of animal products, and economic policy. Philosophically, the ideas of sustainable intensification and holistic naturalism may be based on different conceptions of human nature. Sustainable intensifiers have faith in scientific progress, hold an anthropocentric worldview and see humankind as rightful master of the world. Holistic naturalists are sceptical about science and technology, hold a more biocentric worldview and see humankind as steward of the natural world.

Keywords: agriculture, human nature, environment, intensive farming

Introduction

In 1964 Ruth Harrison's *Animal Machines* – an *exposé* of industrial intensive farming – was published (Harrison, 1964). Harrison had read Rachel Carson's *Silent Spring*, a similar *exposé* of the effect of pesticides on the environment (Carson, 1962). The same period also saw a resurgence in philosophical discourse on the moral question of how we ought to treat animals (DeGrazia, 1996: 2-9). Together with advances in animal welfare science and campaigning organisations such as Compassion in World Farming, this created an atmosphere of public concern about farm animals. Consumer purchasing behaviour has changed as a result of greater awareness about farm animal welfare. The European Treaty of Lisbon recognises animals as 'sentient beings' and mandates that Member States must pay full 'regard to the welfare requirements of animals' (Treaty of Lisbon, 2009).

During the same period there has been a parallel, but largely distinct, environmental movement comprising intellectual, social and legislative elements. For example, the Gaia hypothesis proposes that living organisms, together with the inorganic environment, form a single and self-regulating system on Earth. The Kyoto protocol to the United Nations Framework Convention on Climate Change is a legally binding agreement to reduce greenhouse gas (GHG) emissions worldwide. More recently, some scholars have combined a concern for animals and the environment (e.g. Jamieson, 2002; Rawles, 2010). Advances in climate science would rapidly bring these movements into much closer proximity.

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The link between agriculture and climate change

There is now widespread scientific consensus on anthropogenic climate change (IPCC, 2007). The FAO's *Livestock's long shadow* made clear the connection between agriculture and climate change: the livestock sector is responsible for 18% of greenhouse gas emissions (FAO, 2006). Concern about the effects of global warming has gathered pace. A 'perfect storm' of food, energy and water shortages is forecast by 2030. Global demand for food and energy will jump 50%, and fresh water by 30%, as the population reaches 8.3 billion (Beddington, 2009).The global human population is projected to increase from its current 7 billion, to stabilise at between 8 and 10 billion people in 2050 (IPCC, 2007). Developing countries such as Brazil, China and India are in the process of economic growth. As people become more prosperous, they have consumed a higher proportion of meat in their diets (the nutrition transition, Popkin, 2003). Further, the high emissions from livestock farming are compounded by inefficient conversion of vegetable protein to animal protein. Up to 9, 4 and 2 kg of non-pasture feed energy are needed to produce 1 kg of beef, pig and chicken meat, respectively (McMichael and Butler, 2010). Hence, large areas of land are used to grow crops fed to animals for consumption by a growing human population.

In response to the perfect storm, the UK Government-commissioned 'Future of Food and Farming' (2011) proposes 'sustainable intensification' as a central policy recommendation. Holistic integrative naturalism is an alternative policy position to one that relies on sustainable intensification of livestock production. 'Holism' refers to the thesis that the challenge posed by the perfect storm requires broad-based policy changes to both production and consumption patterns, including elements that drive consumption. 'Integrative' refers more narrowly to describe joined-up and cross-cutting policy processes (see Lang *et al.,* 2009). 'Naturalism' refers to the worldview that sees human nature as being *part* of the wider natural world and living in harmony with it.

Sustainable intensification in the Foresight report

Sustainable intensification is an intuitively appealing solution to the growing demand for food in the face of finite resources in a delicate ecosystem. Intensification involves reducing inputs (e.g. floor space, bedding etc), increasing productivity (growth rates and yields) and economies of scale (larger production units). However, the policy recommendation, and the concept it is based on, has been criticised: 'Is another round of technical intensification needed to raise productivity? That's what the UK's Foresight report argued a few months ago, calling for the oxymoronic 'sustainable intensification.' (Lang, 2011).

Is the concept of sustainable intensification an oxymoron? As a strictly formal concept, sustainable intensification does appear to be contradictory: any *object* of intensification must reach a limit of intensification. But the recommendation is based on population growth that is projected to *plateau* between 2050-2100. Hence, Lang's criticism is ambiguous – the *phrase* contains contradictory terms but sustainable intensification as a *process* is not contradictory if limited in time. Despite this, is sustainable intensification the optimal policy when applied to agriculture? To answer, we need to examine first what the authors mean by sustainable intensification; second, to analyse whether the objectives are realistically achievable; and third, to examine whether such methods will be ethically acceptable from society's point of view.

First, 'Sustainable intensification means simultaneously raising yields, increasing the efficiency with which inputs are used and reducing the negative environmental effects of food production.' (Foresight, 2011: 35). Second, 'Developments in science or technology can influence and increase the efficiency of interventions to reduce greenhouse gas emissions.' (*ibid*. 29). Third, 'New technologies (such as the genetic modification of living organisms and the use of cloned livestock and nanotechnology) should not

be excluded a priori on ethical or moral grounds.'(*ibid*. 11). In fairness, the authors do not recommend sustainable intensification as the sole policy: 'The solution is not just to produce more food, or change diets, or eliminate waste. The potential threats are so great that they cannot be met by making changes piecemeal to parts of the food system. It is essential that policy-makers address all areas at the same time.'(*ibid*. 12). However, Foresight downplays the importance of acting now on meat consumption: 'Policy-makers should recognise that more proactive measures affecting the demand and production of meat *may* be required should current trends in global consumption continue to rise.' (*ibid*. 22).

Livestock intensification and animal welfare problems

Post-WWII British agricultural policy was self-sufficiency in food production, causing the development of intensive farming, which was later driven by economics. But there are limits to intensification, one of which is the living animal (see McCulloch in press). Increasing stocking densities increase stress and susceptibility to infectious disease. The routine use of antibiotics and advances in technology, such as mechanical ventilation, has allowed for the widespread development of industrial farming. Battery cages for laying hens, sow stalls for pigs, rapidly growing broilers and high-yielding dairy cows are all examples of the extent to which farming practices have intensified. Battery hens are deprived of materials needed to satisfy behaviours with strong natural urges (dust bathing and nest building). In terms of space, the birds are unable to stretch their wings. The stress can lead to feather pecking and even cannibalism, controlled by beak-trimming. Pigs are confined in stalls not much bigger than themselves. They are unable to move around and cannot perform the most basic natural behaviours. Broiler chickens now grow so rapidly that many become severely lame (FAWC, 2009).

The ethics of genetic modification

The Foresight report states that genetic modification, nanotechnology and cloning should not be ruled out *a priori*. In Europe there is widespread public opinion against the use of bovine somatotrophin (bST) injections in cows. The use of bST in cattle has been shown to detrimentally affect the welfare of cows (Millar and Mepham, 2001). There is widespread rejection of cloning animals for meat production in the UK (BBC, 2010), which has been criticised due to the high proportion that die shortly after birth (RSPCA, 2010). The British Farm Animal Welfare Council, recently wrote: 'Would it be right to produce, whether by conventional breeding or modern biotechnology, a pig unable to feel pain and unresponsive to other pigs? It might be argued that such a course of action would be disrespectful to pigs, that it is not respecting their integrity (i.e. telos), or that it would involve treating them only as a means to a human end and not, even to a limited extent, as ends in themselves.' (FAWC, 2009: 3).

Holistic integrative naturalism: an alternative to sustainable intensification

The *Future of Food and Farming* report emphasises sustainable intensification as a central policy recommendation. Holistic integrative naturalism is an alternative position to one that relies on sustainable intensification. Rather than suggesting that human population growth and consumption patterns *may* need to be addressed in the future, holistic naturalists believe that these are elements to influence now. Holistic integrative naturalism is so called because it seeks to change the basic causes of global warming. Sir David Attenborough recently gave a lecture on 'People and Planet': 'We now realise that the disasters that continue increasingly to afflict the natural world have one element that connects them all – the unprecedented increase in the number of human beings on the planet.' (Attenborough, 2011). In terms of meat consumption, the reserved tone of the Foresight report is highlighted by comparison with more urgent recommendations. Oxfam recommends 'eating less meat and dairy' to achieve environmental and social sustainability and justice (Oxfam, 2009). There are questions about the role of free market growth-based economics in the current crisis.

In *Prosperity without Growth*, Tim Jackson asks: 'In a world of finite resources, constrained by strict environmental limits, still characterised by 'islands of prosperity' within 'oceans of poverty', are ever-increasing incomes for the already-rich really a legitimate focus for our continued hopes and expectations? Or is there perhaps some other path towards a more sustainable, a more equitable form of prosperity?'(Jackson, 2011: 4).

Discussion

The current problem is to feed a growing human population sustainably. The first element to consider is population size. Demographic projections are estimates and it is possible that the human population will *not* plateau as forecast. Proper risk analysis should account for this. Second, policy-failure will result in more widespread hunger or climate change beyond manageable limits. What lessons can we learn from the problem of hunger today? The World Food Program asks: 'Food has never before existed in such abundance, so why are 925 million people in the world going hungry? In purely quantitative terms, there is enough food available to feed the entire global population of 6.7 billion people.' (WFP, 2011). The diagnosis of the WFP for the hunger problem is that droughts are the most common cause of food shortages, and *basic* agricultural infrastructure will combat hunger. Whereas the developing world has problems of hunger and malnutrition, the developed world has problems of excessive nutrition – obesity, cardiovascular disease and type-2 diabetes (WHO, 2011). Hence the current food problem is principally one of inequitable distribution, *not* absolute deficiency. Third, the conversion of vegetable to animal protein is inherently inefficient. Intensively reared livestock are fed cereals that could be used more efficiently to feed humans directly. Other limitations in the future will be water availability and land. Livestock use far more water and land compared with crop agriculture.

How does sustainable intensification measure against these facts? First, given that a large part of the problem is distribution and not absolute deficiency, it is more sensible to target the underlying problem of distribution directly. Second, intensifying livestock agriculture can lead to further reductions in crops available to the people of poorer nations. Third, intensive livestock agriculture can be associated with deforestation causing further emissions. The most rational policy is 'contraction and convergence' (McMichael and Butler, 2010). This recommends a contraction in meat and dairy consumption in parts of the developed world, and a limited increase in the developing world, ultimately leading to convergence of consumption at a sustainable level. This is consistent with feeding the world more equitably and reducing food injustice. Finally, all of this is consistent with respecting the welfare of sentient farm animals because intensification often diminishes animal welfare. This is consonant with respecting society's democratic concern for animal welfare.

Conceptions of human nature

The doctrine of sustainable intensification is premised on a belief that science and technology can play a large role in the impending perfect storm. Since science and technology are tools that are created and used by humans, this approach implies a confidence in the capacity of humans to use our creative abilities to further knowledge that can be put to good practical use. At a deeper level, the utilisation of science and technology to solve problems with the natural world implies an underlying conception of human nature. This is the outlook of the Enlightenment, in which 'man' dominates nature for his own purposes. In contrast, radical naturalists are more sceptical about the human understanding of the natural world and believe there are limits to the utility of technology. Rather than seeing the rightful place of humankind as above and in control of nature, radical naturalists see humans as a *part* of nature. If *Homo sapiens* is the dominant species, then our natural role is as stewards of a susceptible ecosystem, rather than artificers of control. These characterisations of sustainable intensifiers and radical naturalists are but the modern rationalists and romantics, each with its own perspective on mankind's proper relation with nature.

Conclusion

To reduce emissions of greenhouse gases to levels that will enable a stable and hospitable climate, population growth must be considered and the habit of eating increasing amounts of excessive meat and dairy products reversed. Indeed, intensification of livestock agriculture that leads to increased productivity and cheaper meat could increase demand and fuel the current level of excessive consumption globally. Further intensification will cause increased suffering of sentient animals, which society has judged to be morally unacceptable.

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'All that is solid melts into air': the Dutch debate about factory farming

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Abstract

Over the last years the public debate in the Netherlands about the upscaling of livestock industry received national attention. Particularly in the Dutch region Noord-Brabant, in which most livestock is concentrated, a petition ('no more mega animal stables') had considerable success in putting the issue on the political agenda. It became an important topic in the campaign for provincial parliament elections and the province decided to limit the further growth of factory farms. These citizens argue that 'mega stables' pose a threat to the environment, animal welfare and health, and human welfare and health. However, advocates point to the economic necessity of further upscaling and see no other option. Looking more closely at the underlying visions and ethical/social values of these contrary positions, different farm and food discourses can be identified. Models of capitalist and entrepreneurial farming seem to clash with social and ecological food visions. These different discourses also clarify that the societal resistance against the upscaling in livestock industry cannot be simply reduced to a conflict between economic and ecological values. The social conflict about 'mega stables' also points at the problem how agricultural modernization impacts on interhuman bonds. The role of rural identities and local ties should not be underestimated nor should the absence of protest of local dwellers during (regional) planned procedures concerning factory farming be too hastily interpreted as a solid basis of support. The debate on factory farming is also related with the problem of social cohesion in the countryside. The ethical debate about livestock industry should also acknowledge this social aspect that receives little attention compared to issues such as animal welfare, national health, the environment and biodiversity.

Keywords: livestock, discourse, public support, rural community

Livestock industry in the Netherlands – the development of large scale stables

In the last decades, livestock industry has seriously expanded in the Netherlands. Between 1995 and 2008, dairy farms and poultry farms have been doubled in size and pig farms even tripled (Van der Meulen *et al*., 2011). This development also lead to the development of large scale stables with 300 Dutch Size Units (DSU) or more. (A DSU is roughly comparable to the European Size Unit). As an indication, on 300 DSU locations approximately 7,500 fattening pigs, 1,200 breeding sows, 120,000 laying hens, 220,000 broilers, 250 dairy cows or 2,500 veal calves can be kept in one or more stables. This corresponds with an agricultural area of 1 to 1.5 ha build with stables (Gies *et al*., 2007). From 2000 to 2009 the number of farms bigger than 300 DSU has increased from 334 to 600 and the number of farms bigger than 500 DSU from 77 to 153. The number of locations of farms bigger than 300 NGE also increased: from 2000 to 2009 from 220 to 486 (Van Os and Gies, 2011). Most large size farms are still located on one location which in many cases leads to farms with a more industrial instead of a rural sight.

The development of large scale stables more or less 'fits' in the Dutch reconstruction process which started in 1997 after the outbreak of classic swine fever. This large-scale process drastically interfered in

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the spatial and environmental planning of livestock farming in the Netherlands. The original aim was to radically restructure pig farming to prevent new outbreaks of livestock plagues in the future. In the course of time, however, the course of the plan was broadened and more emphasis was put on an integral and systemic approach to the complex problems of spatial planning, environment, nature preservation landscape, water and economics. This led to the Law on Reconstruction of Concentration Areas in 2002, which was designed to improve the quality of the environment (nature, landscape, water and air quality) and the socio-economic vitality of rural areas. The provincial governments had to make reconstruction plans together with the rural municipalities and social sectors to translate the law in actual measures and procedures tailored to the conditions in that particular area. Moreover, the Dutch Lower Chamber added a comprehensive zoning plan which introduced a zoning of rural areas into three types of areas: agricultural development areas (ADAs) in which the focus was on agricultural activities, intertwining areas which offered some room for manoeuvre for farming activities as long as these were interwoven with residential areas, recreation and nature preservation, and expansion areas in which the focus was on residential areas, recreation and nature preservation (Boonstra *et al*., 2007). For farmers living in expansion areas or intertwining areas this policy meant a drastic change, especially if they wanted to enlarge their farms because they had little possibility for doing so unless they were prepared to move to an agricultural development area. The farm expansion possibilities however met a lot of resistance of local citizens and farmers in de ADAs and of other stakeholders such as environmental NGOs.

Public debate on 'mega stables'

The development of large scale farms caused a lot of commotion. Citizens were concerned about the damage to the landscape, extra traffic, pollution and stench, but also had more fundamental rejections referring to animal welfare, negative effects for developing countries, industrialization of agriculture and bio-industry (Horlings and Boogaard, 2010; unpublished data). Local farmers also opposed to the upscaling in livestock industry, sometimes on principle (De Rooij *et al*., 2010) but also for practical reasons because they feel threatened by large scale farmers who may restrict their possibilities to expand (Bokma-Bakker *et al*., 2011). The resistance of local citizens and farmers and other stakeholders such as environmental NGOs led to a public debate in which subjects like animal welfare and – health, public health, pollution and stench, industrial agriculture and environmental pressure dominated but also subjects regarding more fundamental questions about the Netherlands exporting animal products on large scale, the replacement of animal protein by vegetarian food and the values and perceptions of people with regard to agriculture. It is obvious that Friends of the Earth Netherlands, a non-governmental (NGO) environmental organization with more than 90,000 members, played an important role triggering the public debate. They knew how to mobilize the grass roots opinion. Particularly in the Dutch region Noord-Brabant, in which most livestock is concentrated, a petition ('no more mega animal stables') had considerable success in putting the issue on the political agenda. It became an important topic in the campaign for provincial parliament elections and the province decided to limit the further growth of factory farms. Large scale farming became a well-known topic in national and local newspapers. The tone of these articles became increasingly negative at the moment that the word 'mega farm' or other comparable words such as 'pig flat' or 'pig factory' showed up in the articles (De Lauwere and Vellema, 2011). This sharpened the discussion about 'mega stables' or factory farming.

Polls on the attitudes of the Dutch people towards livestock industry, give a picture of many doubts and discomfort among the broader public concerning the development of this industry. A poll of the Consumer Platform of the Ministry of Economic affairs, Agriculture and Innovation (2010) returned that two thirds of the Dutch population (66%) has concerns about the upscaling of livestock industry. Animal welfare is at the top of their concerns, followed by concerns about stench, the massiveness of animal farming, the decline of small-scale farms, the risk of contagious animal diseases, and the loss of 'natural' quality. A more recent poll (Verhue *et al*., 2011) did confirm that a large part of the population

(ca. 60%) has hesitations about the upscaling that is going on in livestock industry and is not sure whether one can agree with this. This poll also illustrated the polarized debate on this subject: 17% is strongly against upscaling and factory farming whereas 13% has no problem with the upscaling of livestock industry. A majority (59%) agrees that the societal dialogue about 'mega stables' is meaningful and should not only cover the size of the buildings but also issues as animal welfare, animal health, national health, environmental effects, the sites where livestock industry can develop, the upscaling process as such, and the fundamental question whether the Netherlands, a densely populated country, should have (intensive) factory farming.

Also Dutch Ministry of Economic Affairs, Agriculture and Innovation commissioned research on the public attitudes towards livestock industry (Bokma-Bakker *et al*., 2011). Interviews were held with policy makers from five provinces in which the establishment of large-scale farms plays and has played a role. Partly based on these interviews, three case areas were selected. In the case study areas, interviews with officials of the concerned municipalities were held, as well as interviews with citizens and farmers. The following sections present some findings from our research in which we also tried to comprehend the underlying values in the debate on 'mega stables'.

Underlying discourses and 'passive observers'

All in all we see many Dutch people having mixed feelings about the current development of the livestock industry and a highly polarized debate between relatively small groups of supporters and opponents.

However, looking more closely at the values and arguments that are put forward, one can identify different discourses that seem to underlie the positions that are taken. When we use this concept we do not refer to debates or discussions but to narratives and practices that can be helpful to understand different positions and opinions. Once a social group shares fundamental values, a discourse coalition occurs: 'a group of actors that, in the context of an identifiable set of practices, shares the usage of a particular set of story lines cover a particular period of time.' (Hajer, 2006: 70) In this section we will sketch different food and farming discourses and which discourses conflict with each other. In this context we also point out the part that is played by 'passive observers' in the public support for (new) large scale farms.

Food discourses

Our typology of food discourses, that embraces different views on food and health, nature, authority and society, is based on the three main approaches to nutrition described by Lang *et al*. (2008: 116-121) and on the political-cultural characteristics of Schwarz and Thompson (1990):

- *Life science nutrition:* in this vision problems of sustainability will be solved by new technologies that will modernize agriculture and food on a higher level. The conception of food is strongly associated with safety and health. Upscaling of our economy is viewed as a 'natural' necessity.
- *Social nutrition:* in this approach social roots, tradition and cultural habits, but also a strong authority, are considered important. Food is strongly associated with social relationships. Innovations and change are often met with scepticism, certainly when they seem to strain the (local) community.
- *Eco-nutrition:* in this discourse innovations in agriculture and food are only appreciated when they contribute to environmental or ecological advantages. There is a preference for small-scale development and natural resources are considered as very vulnerable to human interference.

Farming discourses

Farming discourses embrace different views on methods of farming and agricultural development. Our typology is primarily based on the three (interlinked) modes of farming distinguished by Van der Ploeg in his study on the new peasantries (2008):

- *Peasant farming*: in this approach agriculture should be built upon the sustained use of ecological capital and oriented towards maintaining peasant livelihoods. Multifunctionality is often a major factor and labour is basically provided by the family or mobilized within the rural community through relations of reciprocity.
- *Entrepreneurial farming*: this vision is built upon the idea of ongoing expansion, basically through scale enlargement. Production is highly specialized, completely oriented towards markets, and largely disconnected from the natural environment and rural communities.
- *Capitalist farming:* this discourse is exemplified by large-scale corporate farming, driving on agricultural export all over the world. Production is geared to profit maximization and organized on strict economic calculation. There are as good as no connections to environment and rural communities.

In the research we conducted (Bokma-Bakker *et al*., 2011) these typologies proved to be helpful to get a more clear view on the structural conflicts that are not always very well visible in the debate on mega stables. In our empirical research, in which we interviewed policy makers, farmers, and representatives of pressure groups, we not only asked after the specific problems and issues that were at stake but also paid attention to the broader visions of the interviewees on agricultural development and food, using our discourse typologies to structure and analyze these visions. The results of this work endorsed our supposition that, on a deeper level, capitalist and entrepreneurial farming approaches are clashing with social and ecological food visions that have become more important in the last decade (see Figure 1).

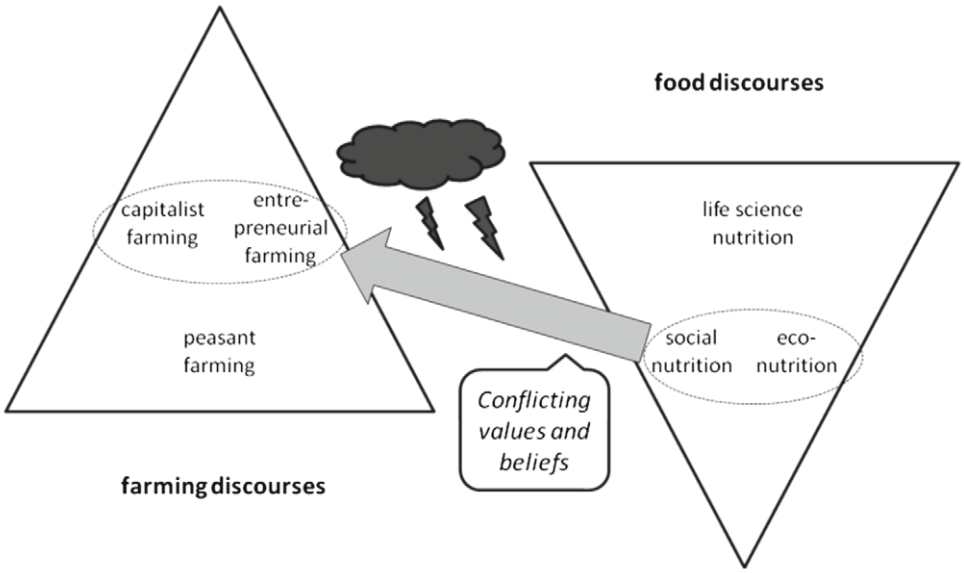

Figure 1. Clashing of farming and food discourses.

Secondly, our research made clear that there is more going on than a 'simple' conflict between economic and ecological or landscape values, as is sometimes suggested in the media. Particularly informative in this context were the few interviews with local citizens that were not actively engaged and could be characterized as 'passive observers'. These revealed that the upscaling in livestock industry may not be rejected because of ecological concerns or related concerns about animal welfare, environment or human health, but because local people will not accept 'strange farmers' that come in from outside, in particular when the owners of large-scale firms have their residence somewhere else. Indeed, it is possible that local citizens sign petitions against mega stables not because of ecological concerns but because of social concerns about 'outsiders' that do not have any social bonds with the local community and are mainly geared to profit maximization. Policy makers confirmed that this problematic aspect of 'strange farmers' has been underestimated in the reconstruction plans.

Thirdly, it should be mentioned that the absence of public protest cannot be interpreted as a touchstone that reconstruction plans for large-scale livestock can count on public trust. The 'passive observers' we interviewed in ADAs (see the first section of this paper), among which an ADA that seemed to go smooth, indicated that their lack of engagement during (regional) planned procedures cannot be interpreted as public trust or support. Behind such passive behaviour many different motives can be hidden, diverging from 'conditional acceptance' that can easily turn into non-acceptance (dependent on health incidents and news reports on animal diseases, distrust towards 'strange farmers' et cetera) to the defeatist belief that protest against such plans will not make a difference.

Conclusion and reflection: the importance of social cohesion

Although the discourses of our typologies are ideal types and will seldom perfectly fit with the views and practices of real people, they proved helpful to structure underlying value patterns. Therefore, these typologies might provide good starting points for dialogues on the deeper controversies that should be cleared up in the societal debate on factory farming and large scale stables. The role of rural identities and local ties should not be underestimated nor should the absence of protest of local dwellers be too hastily interpreted as a solid basis of support. The debate on factory farming is also related with the problem of social cohesion in the countryside.

This may be linked to a more fundamental dilemma of our modern age: the disturbance of social conditions due to the speed of (economic and cultural) change and the uncertainties involved. Hirsch (1978) already pointed to the social limits to economic growth and acccording to Bauman (2007: 2) we live in 'liquid times' in which interhuman bonds become increasingly frail and admitted to be temporary. Although it might be too dramatic to see all solid bonds melt into air, to paraphrase Marx' and Engels' famous saying from *The Communist Manifesto*, the feverish pace of economic upscaling can put rural communities under pressure and lead to tensions and social unrest. The ethical debate about the growth of livestock industry should also acknowledge this aspect of social cohesion.

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Adaptive capacities from an animal welfare perspective

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Abstract

New animal farming system designs, inspired by Complex Adaptive System (CAS) approaches, aim to increase animal welfare by selectively utilizing the adaptive capacity of animals in the design of livestock systems. Our paper addresses the question how to understand the utilization of adaptive capacities to further optimize livestock production systems (LPS) from an animal welfare perspective. We take the recursive control approach (RCA) as a case. RCA builds on central elements of CAS theory, while it is conceptually based on philosophy of technology. We raise the question whether attempts to use natural adaptive behaviour of animals as an integral part in the functioning of LPS, sufficiently protects these animals from being subjected to a process of concretization. We argue that integrating animal specific adaptive behaviour in the structural system design adds extra complexity to the system and is expected to lead to intensified management pressure and an increase in technological control measures.

Keywords: husbandry, adaptation, instrumentalization theory, recursive control

Introduction

The insight that agricultural systems are in constant co-evolution with their environment has increased the relevance of adaptability as target of research in agricultural science. This results in more attention for the dynamics of farming systems and their contexts. Especially the possibilities of complex adaptive system (CAS) theory to explain agricultural dynamics are being explored (Darnhofer *et al*., 2010). The CAS approach is useful to study those kind of systems that have, what John Holland (1992) called an 'evolving structure', referring to their capacity to change and reorganize their component parts to adapt themselves to the problems posed by their surroundings. Systems, in other words, that constitute a 'moving target', because both internal and external dynamics can lead to substantial structural system changes, difficult to understand and control. CAS approaches strongly defy reductionist thinking, and take a hierarchically nested system view to explain how system structures arise from the interaction of basic elements at lower system levels. In Livestock science, the CAS approach offers a concept to analyse a production system's adaptability to keep up with complex social-technical and social-ecological developments. The CAS approach presumes a recursive relationship between system components. The application of CAS theory extends diverse and large problems from ecology to information technology and from biology to economics. Because CAS have shown a capacity to organize around continuous change, CAS thinking is attractive for the design of new systems in increasingly uncertain environments. In this paper we consider one approach that aims to re-integrate adaptive capacities at animal level in agricultural system designs as a means to reduce system complexity, and increase overall robustness, namely the recursive control approach (RCA) as described by Bram Bos *et al*. (2003). The RCA is an interesting case because it combines central elements of CAS theory with a theoretical foundation on philosophy of technology, and yet takes the adaptive capacities of farm animals as a point of departure in system design. Before we move to this case and describe some of the tensions that arise when taking adaptive capacity of animals as a point of departure in system design for animal welfare in livestock production systems (LPS), let us consider complexity thinking and the growing interest in adaptability in Livestock sciences.

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Complexity and adaptation in livestock science

While in traditional system design the concept of control is deeply rooted, complexity thinking is relatively new and the integration of adaptive capacities therein even more. The idea to make use of existing adaptive capacities in the structural design of production systems is therefore less straightforward than it may seem. Because adaptive capacities have long been neglected or contained and manipulated, the design of a system that deliberately builds on and exploits existing self-organizing, adaptive capacities, requires a radically new system approach. As Darnhofer *et al*. (2010) argue: 'enhancing adaptability goes against the recommendations derived from an engineering approach to farm management'. First of all, because there is a strong believe in trade-offs between efficiency and adaptability. From an engineering point of view, adaptability has a high price because strategies to enhance adaptability require resources. Additionally, taking adaptive capacity as a starting point for system design is an unexplored approach that not only requires an understanding of the ability of diverse system elements to be adaptive, but ideally more than a vague understanding of the kinds of changes that will challenge the adaptive capacity of these system elements, and the LPS as a whole. This knowledge is still lacking.

Different manners and specific approaches on different system levels are being developed to strengthen the adaptive capacity of LPS, but their implementation and integration seems a major challenge to enhance adaptability of the LPS as a whole. On the social level, agricultural innovations, and the interactions between involved actors are increasingly being analysed, explained and steered in terms of CAS (Darnhofer *et al*., 2010; Klerkx *et al*., 2010). New system design approaches, although not explicitly referring to CAS theory, make use of insights from complexity theory, for instance by seeking legitimacy and public support by allowing different groups of stakeholders to participate in design processes. Integration of elements from CAS theory can also be recognized in conceptual engineering approaches to increase robustness and sustainability of LPS (Ten Napel *et al*., 2006, 2011). At animal level, adaptive capacity is also deliberately utilized to increase robustness to unwanted fluctuations and improve animal welfare. Strategies to develop adaptive capacities of animals include 'guided learning' through controlled-exposure-under protection, early life experiences (Walstra *et al*., 2010), or genetic selection (Kanis *et al*., 2004, 2005; Star *et al*., 2008). Ten Napel *et al*. (2011) stress the importance to utilize the intrinsic adaptive capacity of animals to maintain the desired system performance in LPS.

While animal welfare is one of the most important social attributes of sustainability, the relevance of adaptive capacity and robustness vis-à-vis animal welfare is unclear, especially when explicitly utilized to improve overall system performance.

Case: adaptation in the recursive control approach

It has been suggested that through cleverly designing, i.e. making use of the potential of technological synthesis of needs of different stakeholders, seeming contradictions between for instance animal welfare and economic efficiency can be softened or even designed away. This idea has been applied at farm level in the RCA, which considers the natural behaviour of animals as an integral part of the functioning of livestock systems. According to Bos *et al*. (2003) the potential of animals to act as a participant and co-construct order in their production systems has structurally been neglected in 'unidirectional control' approaches that characterise traditional livestock farming. Rather than suggesting that animal behaviour is a societal requirement that is at odds with economic and ecological conditions, the RCA favours an increased contribution of animals to the functional order of the system as a means to attain different sustainability goals simultaneously. As Bos *et al*. argue, this implies 'that we adopt a perspective in which animals are seen as participants and co-creators of the system, rather than as elements to be contained and manipulated by the system'. The idea that farm animals should be seen as agents that through their behaviour with each other, other agents and their environment construct patterns of interaction and

systemic structures is central to the CAS perspective. The RCA is unique in explicitly granting animals a participating and co-constructing role in the LPS, and this perspective therefore suggests to be one of the most far-reaching implementations of adaptive system thinking in livestock science. However, conceptually the RCA is based on Feenberg's Instrumentalization theory (Feenberg, 1999, 2010). Feenberg analytically distinguishes the functional aspect from the social implementation of technology. The functional aspect, or primary instrumentalization describes the decontextualization of objects in the life world and their functional reduction to a limited number of useful properties. During the social implementation, or secondary instrumentalization of new technical arrangements, recontextualization takes place through specific meaning and use, integrated and connected to existing practices, meanings, aesthetics, values and goals (Bos, 2008). Traditional engineering approaches have differentiated the two aspects of instrumentalization and marginalized the role of secondary instumentalization in the design of LPS. The RCA aims to restore the role of secondary instrumentalization by explicitly integrating values, such as animal welfare, in the design process. It suggests, in other words, to shape the context around the natural behaviour of either laying hens, sows or cows in such a way that their behaviour contributes to the system's goal. The approach insists that treating animate and inanimate entities similarly in aiming to control their behaviour is not only unnecessary, but also adverse to the functioning of LPS. The RCA therefore argues to re-organize the system in such a way that animals actively shape the system. It mixes technical and nontechnical ordering mechanisms in a deliberate and planned way. It proposes an assessment of the values and demands of all actors involved in LPS and an integration of these values as early as possible in the design process of new LPSs, a design strategy that was applied in The Houden van Hennen project (De Lauwere and Luttik, 2004). This project developed a programme of demands of farmer, laying hen, and citizens/consumers as a first step in the design process and led to the development of the Roundel system (see http://www.rondeel.org/index1.php), the first non-organic laying hen husbandry system to receive the highest valuation for animal welfare from Dutch NGO Dierenbescherming.

Discussion

One essential feature to make recursive control possible is the natural adaptive response of the animal in LPS (Bos *et al*., 2003). However, in the Roundel system, these adaptive capacities are not utilized. One could say that the Roundel system has re-integrated laying hens in a social-technical agricultural system with the intention to solve several problems of laying hen husbandry simultaneously. The system respects the needs of the laying hen by taking their spontaneous adaptive behaviour as a starting point in the design process to protect their own health and welfare, but also deliberately to increase the overall efficiency of the system. Hence, previously suppressed behaviour is exploited in favour of animal welfare, health, emission reduction and operational efficiency. Rather than inviting animals to participate and co-construct the system, the system selectively tolerates behaviour that was already present, but unidirectionally controlled and not yet instrumentalized. Although this may have significantly improved animal welfare, it does not fully live up to the promise that animals participate or actively co-construct the system. In the secondary instrumentalization, which in the RCA was understood as the active shaping and reordering of technical elements of LPS by its living entities, the laying hen has only played a marginal role. Moreover, while the RCA did suggest to adopt a perspective in which animals gain influence in the social implementation of technology, the role of the animal in the primary instrumentalization is left aside. Since primary and secondary instrumentalization should only be analytically distinguished, participation in the latter cannot occur without reconsidering the first. An interesting philosophical question would be whether the animal should then indeed be seen as a participant in the democratic rationalization of LPS or as a technical artefact to be used in them instead.

In his critical theory of technology (Feenberg, 2010: 158-180), Feenberg mentions innovations in agricultural systems as an example of concretization (Simondon, 1989), but he does not give a clear

opinion about the position of animals in his theory., During the process of concretization, objects develop potential to fulfil multiple functions simultaneously. It is a process that, according to Feenberg (2010: 78) 'explains how wider or neglected contexts can be brought to bear on technological design without loss of efficiency'. Simondon himself understood plants and animals as completely concretized objects, strictly reserving the process of concretization to abstract, technological systems (Schmidgen, 2005). By explicitly relating the RCA to Feenberg's instrumentalization theory and Simondon's notion of concretization the question arises how the RCA can prevent a technological view on the animals within LPSs, which would imply that the animals within the technological agricultural system are simultaneously subjected to a process of instrumentalization and concretization, rather than making them true participants in the democratic rationalization of LPS.

Adaptive system designs and adaptive management strategies suggest to unburden management pressure by abandoning the norm of uniformity. Adaptive management strategies are sometimes believed to reduce the complexity of complex system. From a system management perspective, it must be recognized that current LPS are designed for average animals. Based on scientific and political norms of ethological needs, LPS provide average conditions to fulfil average requirements. Where uniformity is the norm, management can concentrate on deviations. We argue that integrating human-controlled adaptive capacities of animals to a highly optimized technological system as current LPS are makes these systems more complex. Bos *et al*. (2003) recognized that the RCA 'is at least as knowledge- intensive as the technical approach, but this knowledge derives from a wider diversity of disciplines, ranging from mechanical engineering to ethology'. Especially since the approach raises the abstraction level to the housing system as a whole, management pressure is expected to increase. In addition, the emphasis on utilizing adaptive capacity of farm animals does not release the farmer from his responsibility to monitor and take care after individual animals. This could lead to an increase in technological control measures, and spiralling complexity.

Conclusions

We argued that RCA builds on central elements of CAS theory, while its conceptual basis lies in philosophy of technology. At the same time the RCA argues that we should see animals and their adaptive behaviour as co-creating the structure of LPS. We argued that, despite its achievements with regard to animal welfare, at least in the Houden van Hennen project, the RCA does not live up the promise of letting laying hens actively participate and co-construct, but rather resulted in increased tolerance of previously suppressed behaviour. While it is assumed that the potential to make recursive control possible relies on the adaptive capacities of animals, the adaptive capacity of the laying hen in the Roundel system are hardly challenged. In addition, the integration of natural adaptive behaviour in the system adds complexity to the system, and leads to more intense and more diverse knowledge dependence.

Although explicitly related to Feenbergs's instrumentalization theory and Simondon's notion of concretization, the RCA does not sufficiently clarify to what extent the suggested participating and co-constructing role of animals includes the functional instrumentalization. The question arises whether both the technical and nontechnical elements of LPS are subjected to a process of concretization. Rather than rejecting the premise that animals are technical artefacts, recursive control thus leaves open the possibility to design precisely those animals that exhibit the natural behaviour that contributes best to human needs. The suggestion that natural animal behaviour and human interests in LPS can fuse together might even add to the need to design animals with human controlled natural behaviour.

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Agriculture's 6 Fs and the need for more intensive agriculture

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Abstract

The discussion about the functions of agriculture needs to be broadened beyond the Food-Fuel-Fibre discussion. The '6F' framework has been proposed that incorporates most – if not all – functions of agriculture: Food, Feed, Fuel, Fibre, Flower, and Fun. In an increasingly resource restricted world, agriculture is confronted with an increased demand for each of the 6 Fs. Climate change will increase the 'natural' stress on production in regions that are already less favourable, while population density and civil pressure will increase 'human' stress on production in regions that are well suited for agriculture. Data on water availability, water stress and natural production capacity of different world regions clearly show that (1) many regions rely on irrigation for large parts of their food production (and agricultural production in general); (2) most of those regions experience (or will soon experience) water stress; and (3) the water stress indicators of other regions (e.g. Europe) are equally high, although water seems abundant there. Historically, the largest populations have grown where food production was easiest. For example the coastal areas of the US, Western Europe and Eastern Parts of China are areas with much arable land and large populations. This has resulted in much of the world's most valuable arable land now used for other purposes (habitation, industry, etc), something that is nearly impossible to reverse. Additionally, and quite evident in Western Europe, industrialised societies increase their non-production demands on the rural areas: recreational use of 'the outdoors', pleas for the conservation of 'natural vegetation', etc. Given that higher production is necessary (more people, more consumption), we cannot increase our production apparatus (land, water), and our current apparatus will be under more stress (climate change, environmental protection), the challenge for the future is clear: more for more, with less. Thus, agriculture must intensify (increase the output/input ratio; an improvement of efficiency by better management). The inevitable outcome of the 6F equation is that we have no choice but to intensify production methods and stop tolerating efficiency losses on a global level. The only other option is to strike some of the Fs from the equation.

Keywords: resource distribution, sustainability, land use

Introduction

In an earlier paper (Aerts *et al.*, 2009) we have proposed a broad but concise scheme to frame the discussions about the many dilemmas that surround agriculture. We argued that the discussion about the functions of agriculture needs to be broadened beyond the then high profile Food-Feed-Fuel discussion. Even now, influential and wide-scoped articles such as that of Foley *et al.* (2011) do not include all aspects proposed in the '6F' framework which incorporates all functions of agriculture: Food, Feed, Fuel, Fibre, Flower, and Fun.

In the following paragraphs we will briefly define the different concepts (Fs) and summarise the way the 6 Fs frame the (most important) agricultural dilemma: the interaction between the different functions of agriculture.

We will then proceed to show how different external factors relate to the 6 Fs, resulting in an urgent need to intensify agricultural production, defined as an increase in the output/input ratio.

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Definitions

Food: little explanation is necessary if this is interpreted as 'any agricultural produce aimed at direct human consumption'. A stricter interpretation could exclude products such as wine and beer (see Fun) and other non-essential food products (sweets, chips, etc.).

Feed: basic agricultural commodities produced to feed animals (directly or indirectly). For example grains, soy, but also grass.

Fuel: agricultural products destined for energy generation, directly or indirectly. Includes the typical biofuels of different generations, but also includes solid biofuels, vegetable oils, etc., and possibly even firewood.

Fibre: here we include the classic natural fibres (cotton, line), but also the basic commodities for the 'green chemistry' that produces bioplastics. Wood as a building material could also fit under this topic.

Flower: this category includes in general all non-edible horticultural production (flowers, shrubs) and – in order to limit the number of Fs – also the protection of wild nature, special habitats (national parks, reserves), etc.

Fun: again, this includes two types of 'production': recreational activities in the 'open' areas, and the drug-related production types. These are not only the drugs in the 'strict' sense (e.g. coca), but also tobacco, and maybe even the grapes and cereals used in alcohol production.

Six variables, one equation ($f_1 + f_2 + f_3 + f_4 + f_5 + f_6 = y$)

The 6F model summarises and structures the different functions agriculture has in our contemporary society, including those that are often neglected. The different functions are often considered or discussed independently (e.g. feed vs. climate, biofuel vs. climate), but this underestimates the impact of the interactions between these functions.

Not only are there direct technical links between different Fs – e.g. use of food by-products in feed – also many indirect effects exist between different functions. The direct links indicate that one function is not technically independent of (all) others; the indirect connections are the core of the 6F framework. Constraints ('boundary conditions' in the mathematical analogy) such as water and soil availability provide a worldwide interaction between all functions of agriculture. This is true in a physical and geographical sense (a hectare can only produce one or few Fs at the same time), but certainly also in an ethical sense (can we produce anything anywhere?). These constraints will be clarified in the following parts of this paper and will be the basis for our conclusion. This also means we will not elaborate on issues such as global trade regulations, global distribution of resources, land grabbing, power of multinational companies, etc. that also strongly influence the ethical debate on agriculture.

External constraints to the equation

Competition for water

On a global level, over 2/3 of all freshwater withdrawal is directed to agriculture in its many forms (FAO, 2006). This impressive figure hides an important variance between continents (from an average of 29% in Europe to 86% in Africa), and between regions (e.g. ranging from 8% in Western Europe to 60% in Mediterranean Europe and well over 90% in some Asian and African regions), as is apparent

in the AQUASTAT database (FAO, 2010). On both a global and local level, this means that in some regions agriculture will suffer when water becomes scarce.

Additionally, AQUASTAT shows that about 300 million ha of land is cultivated using irrigation (about 20% of all cultivated land, varying from 0% to a 67.2% in different regions), 37.5% of which by using groundwater (varying from 0% to 88.4%). Combining water withdrawal for all uses with water availability yields a 'water stress indicator', that shows – not surprisingly – that many areas of the world (especially those with much irrigation based agriculture) are close to their withdrawal limits (if not over those limits). See for example maps in *Livestock's Long Shadow* (FAO, 2006: 351), in *Agriculture, Food and Water* (FAO, 2003: 23), and *World Water in 2025* (Alcamo *et al.*, 2000). It must be stipulated that some parts of Europe are also considered to be under 'severe water stress'.

Even under the assumption that agricultural water withdrawals do not increase significantly beyond the 1995 level, Alcamo *et al.* (2000) showed that in a business-as-usual scenario global water stress will increase enormously by 2025.

Summarising, on a global level we have probably reached the maximum sustainable level of freshwater use in agriculture (and in some regions, we are beyond that).

Competition for land

Historically, the largest populations have grown where food production was easiest. For example the coastal areas of the US, Western Europe and Eastern Parts of China are areas with much arable land and large populations. The importance of this food production potential for societal development has been eloquently described by Jared Diamond in his *Guns, Germs and Steel* (Diamond, 1997).

Comparing population density with crop production capacity maps, it is clear that this correlation is still high. Unfortunately, this also means that in these areas the amount of land used for infrastructure is high (see e.g. the map by Erb *et al.*, 2007). This means that much of the world's most valuable arable land is used for other purposes (habitation, industry, etc), something that is nearly impossible to reverse.

Additionally, and quite evident in Western Europe, industrialised societies increase their non-production demands on the rural areas: recreational use of 'the outdoors', pleas for the conservation of 'natural vegetation', etc.

Comparing soil, terrain and water constraints (as indicated on maps by Fischer *et al.*, 2002) and land use for agriculture (as mapped by Erb *et al.*, 2007), is seems the vast majority of suitable land is already cultivated. Foley *et al.* (2011) add to the same conclusion that the net contribution of cultivated land expansion to production increases has been limited over the last decades. Again, on a global level we have probably reached the maximum sustainable level of land use for agriculture (and in some regions, we are beyond that).

More for more with less: a conclusion

In an increasingly resource restricted world, agriculture is confronted with an increased demand for each of the 6 F's, as has been discussed earlier (Aerts *et al.*, 2009). Climate change will increase the 'natural' stress on production in regions that are already less favourable to agricultural production, while population density and social evolutions will increase 'human' stress on production in regions that are well suited for agriculture. The latter effects are discussed in more detail in our 2009 paper.

If more production is necessary (more people, more consumption), we cannot increase our production apparatus (land, water), and our current apparatus will be under more stress (climate change, environmental protection), the challenge for the future is clear: more production and more functions for more people, with less inputs (such as, but not only soil, water, energy). In summary: more for more with less. This conclusion still stands if we accept that Western societies will have to continu on a lower consumption level; in many or all other societies we can expect significant growth (essential for survival in some). This is very unprovocatively summarised by Foley *et al.* (2011) as 'In short, new agricultural systems must deliver more human value [...] with the least environmental harm.' Phrased more directly, agriculture must intensify.

This conclusion gains strength when one goes beyond the limited Food-Feed-Fuel approach used by Foley *et al.* They may not be as high-profile as the former three, but Fibre, Flower and Fun also impact on the global agricultural production/environmental equation. The influence of cotton irrigation on the disappearance of the Aral Lake is a simple but strong example.

It must be clear that 'intensification' in this respect is not meant to be 'a global deployment of Western European or Northern American agricultural methods'. Instead it is understood as 'an improvement of efficiency by better management'. Since efficiency is always a ratio (for example: output – waste / input), there are different methods to reach this goal. We could cut inputs, increase outputs, avoid waste or any combination of these.

The inevitable outcome of the 6F equation is that we have no choice but to intensify production methods. The only other option is to strike some of the Fs from the equation; the possibilities and merits of that approach will be analysed in an upcoming paper.

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Feed efficiencies in animal production: a non-numerical analysis

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Abstract

More and more, animal production is questioned, not only by animal welfare organizations or vegans, but also in the context of climate change. Some even say that animals are the number one greenhouse gas emitters, not only directly (e.g. ruminants), but also indirectly by land use change, especially in South America. Others say that animals are a very inefficient way of food production, since feed conversion always means a certain loss. From a food production point of view, animal production can be divided into three groups. The first one is the group of extensive grazers. Since only a small percentage of the land surface is arable land, herbivores (especially ruminants) are the only way to produce on – from an anthropocentric point of view – 'useless' grounds. Also, one billion poor people in those regions are depending on animals for food, manure, draught or as 'living bank' in those harsh conditions. Animals are thus necessary to survive and everything produced by them can be seen as a net gain, increasing the land use efficiency. Secondly, animals can be used as converters of crop residues, especially meals from vegetable oil production for human consumption, chemistry or biofuels. Animals, especially ruminants, are very efficient in recycling energy and proteins which are not digestible or wanted as food by humans (or other animals). Probably, second generation biofuels shall replace at least for some part the use of animals as converters, depending on economics or policy. To balance the animals' diet, also grains are needed to make sure the animals stay healthy. If you look at feed efficiency in this way, efficiency ratios for different animal species differ from the traditional feed conversion and for some species animal production even means an efficiency gain. The third group is the surplus group. Those animals are produced not because they use 'useless' land or energy and proteins, but because some people are wealthy enough to feed them with edible products. Although some of them have the best feed conversion ratios, this group of (mostly monogastric) animals produces animal products in an inefficient way from a human-animal-competition or ecological point of view. Only this group of animals could be considered as ethically problematic. It will become a pressing issue because of the increasing demand from upcoming economies for animal luxury products.

Keywords: monogastric animals, ruminants, feed conversion, ethics

Introduction

For centuries, animals and humans live side by side. Humans took care of animals, feeding and protecting them, and making use of them in order to meet human needs. Animals were and still are used for many reasons: as draught power, for the production of wool and leather for clothing and as a living food source for the production of eggs, milk and meat. Moreover their manure is used as fertilizer and energy source. This can be observed all around the world, although the animal species used differs from continent to continent. Although the species differ, one also could see similarities: smaller monogastric animals were kept near the houses, while larger herbivores were kept further away (Steinfeld *et al.*, 2006). This phenomenon can be explained by the fact that grasslands often are usually situated at longer distances, so larger herbivorous species are more useful because they are able to move further and they are able to convert feed sources which are indigestible for humans. Near the houses, smaller animals (e.g. chickens, turkeys and pigeons on land, duck and geese in the water) were kept as collectors of small particles like seeds, weeds and insects or as converters of waste and surplus production. Pigs were literally piggy banks: besides what they found scavenging around the farm, they were fed with the

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surplus production of the farm and with table waste, and slaughtered in winter to regain the proteins and energy 'invested' during the year.

Due to intensification and increasing wealth in Western societies from the twentieth century on, our view on animals has changed. Where animals used to be 'converters', i.e. a means to transform waste into something useful (animal products, manure, leather, etc.), they became more and more 'producers'. The main goal was no longer to make 'something out of nothing', but to produce one specific product, mainly meat. Ever increasing intensification and changing selection goals towards single purpose breeds accelerated this change, not only in the way we are looking at animals, but also in the way we are treating them. In the past mainly 'unwanted' animals were slaughtered (surplus of males, old animals), but from now on also young, healthy females are used to produce meat. This change in perspective led not only to more intensification of life stock production, but also to more management because feed and housing were optimized to produce as much milk, eggs or meat as possible. Where in the past, animals collected their feed themselves, due to intensification, roles have changed: humans collect the feed for their animals. Especially in densely populated areas, enough foraging land is almost never available for both ruminants and monogastric species, certainly not for the large numbers of animals kept on one farm nowadays.

After a period of increasing efficiency in animal production, some of the 'most efficient' housing systems and techniques have been questioned from an animal rights and animal welfare perspective. Common practices have been severely criticized and some of them are already banned in the E.U. So less efficient management techniques are preferred in some Western countries. Not only management practices are discussed, but also the feeding strategies used in intensive animal farming are questioned. Animals are no longer perceived as 'a useful way to convert inedible feed resources into high quality food' but as 'a wasteful conversion of food' since some diets, especially in intensive monogastric production like poultry and pigs, contain a high percentage of grains and other feed resources which are also digestible by humans. Since increasing wealth implies a larger demand for animal products (Steinfeld *et al.*, 2006), a further expansion of animal husbandry is expected since the need for meat, eggs and milk will increase (Speedy, 2004), especially in the upcoming economies in Asia and South-America. Higher welfare and a still increasing world population will create a higher demand worldwide and thus the demand for both food and feed will increase. Although there is theoretically enough food available worldwide to feed everyone, still about one billion human beings suffer from hunger right now (FAO, 2010), mainly caused by problems of availability and accessibility, often as a result of political issues and higher food prices. Since the world's human population is expected to grow to 9 billion people towards the year 2050 (UNDESA, 2011), one needs to seriously discuss the ethical acceptability of this increasing demand for animal feed because it causes a competition between humans and animals for the limited amount of cultivable land available.

In what follows, we will discuss the ethical implications of three forms of feeding strategies in animal production: production based on 'useless' land, production based on 'residues', and production based on 'surplusses'. For the ethical analysis we will consider two aspects: (1) current and projected competition between humans and animals, and their impact on food availability, and (2) the efficiency of the production type at hand. Production efficiency can be defined in different ways. We propose to use an approach that closely resembles that of Van Es (1975) in that it looks at the input/output ratio of components (or energy) that are also metabolisable by humans.

Production on 'useless' land

About 26% of the world's land area is occupied by permanent pastures (FAOSTAT, 2009a) and is not suitable for crop production due to climate or soil conditions. Especially in arid regions, where vegetation

is scattered and scarce, animal production is the most efficient way to collect vegetal proteins and energy in order to convert them into something useful for humans. More than 50% of the land used for animal production is extensive grassland (Steinfeld *et al.*, 2006), only suitable for herbivores. Due to the very extensive way of animal husbandry, the low quality feed and the traditional breeds which are not selected for efficient growth, feed conversion ratios are low, but the local people often consider this way of animal production as a necessity or at least a necessary means for survival in these harsh conditions. Here, animal production can be seen as stewardship at its best: taking care for living beings and using their products in a well-balanced way.

One can question whether this is the best way to manage this type of land. It seems very plausible that the digestive tract of local non-domesticated species is better adapted to the local vegetation, resulting in a better feed conversion. Hunting these species would be more efficient in that respect, but it is technically and practically inefficient. In some parts of the world however, hunting on large grazers by tourists generates large economic revenue, resulting in income for local people, in wildlife and biodiversity protection projects and even breeding programs for rare species. As this will only be a small-scale, local alternative, it is unthinkable that this is sufficient to feed the more than one billion people living in Africa (estimation by U.S. Census Bureau, 2011). Animal production by domesticated species is more convenient and thus needed to meet humans' needs for macro- and micronutrient intake, especially in those areas where animal products is the main or single food source in some months of the year. Although it seems very natural to let herds forage on grasslands, it often results in major problems. It is very difficult to create a sustainable balance between land capacity and herd size in a socio-cultural context where large herds symbolize wealth, because large herds may result in overgrazing and desertification (Steinfeld *et al.*, 2006).

In industrialised countries ruminants are also kept on marginal lands, permanent pastures or in rotation in a three-field system. Certainly the former two are often unsuitable for crop production, so from an utilitaristic point of view, animal production on these grounds is the best choice. From the 3.9 billion hectares used for animal production, 1.4 billion hectares or 36% of the total area is relatively intensive grassland (Steinfeld *et al.*, 2006), a large area that until some years ago could only be used by animals.

From an ethical point of view, since animal production on grasslands by ruminants does not compete with human food production because those non-digestible feeds are 'useless' for humans, it does not cause any problem. It has to be welcomed as an excellent opportunity to provide in human food as long as the equilibrium between animals and ecological carrying capacity of the land is respected. Since there is no competition in this case and the overall efficiency is high when using ruminants (high net gain of energy, proteins, etc.), this kind of animal production is ethically very defensible.

Conversion of 'useless' proteins and energy

In intensive animal production, animals are – except for specific production types – no longer kept free-range, but they still convert products which are unsuitable and unwanted for human consumption. Many useful feed products are by-products of food production processes like sugar extraction, vegetable oil production, brewing, milling and the industrial vegetable industry. In Europe (FEFAC, 2011), about 40% from the basic feed materials are by-products of which cakes and meals are the largest group (27%), followed by co-products from food industry (12%). Those by-products vary in nutritional value, and therefore the rations often have to be supplemented with grains and other additives to balance energy-, protein- and amino-acid-content. Animal production on residu-based feed alone seems only possible when there is a low demand for meat (Keyzer *et al.*, 2005).

Animal by-products have been used until the European government banned animal meals due to mad cow disease (EC, 2002). As a result of this regulation, more than 3.5 million tons of meat-and-bone meal (MBM) produced in Europe (Coutand *et al.*, 2008) have been used as an energy source (combustion) and at a smaller scale as fertilizer, also in organic farming (Mondini *et al.*, 2008), or in pet food. Since MBM was used in animal feed, it was replaced by other sources of proteins, predominantly soy meal. Steinfeld *et al.* (2006) state that 1 ton of MBM has the same protein value as 1.16 tonnes of soy meal or 1.48 tonnes of soybeans. Replacing the total production of MBM means an import of about 4 million tonnes of soy meal or more than 5 million tonnes of soybeans or the yield of about 1.5 million hectares. The proposal of the European Commission to lift the feed ban for non-ruminants (European Union, 2010) should allow animals to converse MBM into high-quality animal products again and should decrease the need for cropland for animals.

Recycling vegetal by-products does not cause competition with humans, since they will never be used for human consumption. In order to give the animals a well-balanced diet, cereals and other additives are necessary. Although this causes competition with humans and could be considered as ethically unwanted, the animals could suffer from malnutrition when the rations are not well-balanced. Moreover a surplus production of cereals is necessary in order to create stocks for securing food security. In that case, even if cereals were produced for human consumption only, in case there is more grain than needed, using this cereal overproduction to balance the animals' rations will not be considered as an ethical problem, as long as the number of animals is adapted to the amount of by-products available.

Although the use of animal by-products causes other ethical problems, which are not discussed in this paper, it does not cause ethical problems in the ethical frame used here. Since the animal by-products are not used in human consumption, there is no competition and because of the high nutritional value, the use of animal by-products, as long as it is safe, means an increase in efficiency when used in animal feed. They could also replace some of the human-suitable parts of compound feeds.

Surplus based meat production

When wealth increases also the demand for animal products will rise. As long as it is economically viable, we expect that farmers will produce meat, eggs and milk by all means. Especially monogastric animal production is increasing rapidly (FAOSTAT, 2009b) driven by their high fertility rates and the intensive production methods, leading to lower feed conversion ratios. The biggest increase in production can be found in poultry (FAOSTAT, 2009b), likely due to both agricultural (small body-size, fast reproduction…) and cultural (lean meat, accepted by most religions…) advantages.

Where the number of heads (i.e. living animals) in the past was a function of the feed available, feed is now produced to feed the number of heads which have to be produced to meet the increasing demand for animal products. Nowadays, about 33% of all cropland is used for animal feed production (Steinfeld *et al.*, 2006) and 35% (on a mass base) of the total crop production is used as animal feed (Foley *et al.*, 2011). It is estimated that total meat demand will double in 2050 (Steinfeld *et al.*, 2006) and since most of this will be produced by monogastrics, a strong increase in cropland for feed can be expected, although efficiency gains in both feed and animal production will slow this increase.

At this point, one could ethically question animal production, since there seems to be a large competition with humans, directly and indirectly. Often it is heard that feeding grains to animals leads to higher grain prices on the world market, making the availability of food for poor people more worse and thus increasing hunger. Although animals will compete worldwide with humans for the same feed/food products and the earlier defined efficiencies are negative, Srinivasan *et al.* (2006) calculated that when following WHO dietary norms, the demand for meat would decline in OECD countries. But since this

will be substituted mainly by cereals, the net cereal demand would stay more or less the same in both cases. One could question if there is competition after all in these countries. Of course, in developing countries there will still be a huge increase in demand.

Is animal production inefficient? A conclusion

Discussing efficiency in animal production is very complex and the result often varies with the parameters taken into account. Even if one only discusses feed efficiency, the result differs if one is looking at the raw feed conversion (input versus output) or at the net energy gained (i.e. excluding inputs that can be used by humans). Different conclusions could be taken. At one hand it is important to consider that chickens have the lowest feed conversion ratio and are – from that point of view – the most efficient land-based species. On the other hand, ruminants are the most efficient in land-use and conversion of non-edible biomass, making it possible to use inputs which are unsuitable for humans. So although ruminants have a higher feed conversion ratio, they are not 'inefficient', especially if one takes also other animal products such as leather into account.

In this paper, we distinguished animal production into three groups, based on how the animals are used: grazing on 'useless' grounds, fed with by-products or produced on 'surplus' vegetal production. These groups were compared for both competition with humans and the efficiency ratios. We used an approach which closely resembles the one of Van Es (1975). The summary of this ethical analysis is visualised in Table 1.

Both animal production on 'useless grounds' and on 'useless' proteins and energy result in an efficiency gain for human food production. They both also do not cause competition with humans for edible products, although a certain volume of grains is necessary to balance feed rations when using by-products. The surplus meat production by monogastric species which are fed with rations with high cereal content do cause competition with humans and also their efficiency (as defined supra) is negative. Since this group is growing due to increasing world meat demand, this form of animal production will become increasingly ethically problematic in the future.

Table 1. Summary of competition and efficiency effects of different feeding strategies.

	Competition	Efficiency
'Useless' grounds	++	++
'Useless' proteins & energy	±	+
Surplus meat production	-	-

Scores: '++' indicates ethically good effects (no competition, high efficiency); '-' indicates negative effects, '±' indicates an intermediate situation.

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For the benefit of the land? Ethical aspects of the impact of meat production on nature, the environment and the countryside

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Abstract

What is the impact of animal production on the world before it becomes the meat we eat? There is little doubt that livestock production substantially affects its surroundings. FAO talks about 'a long shadow' cast over the environment, nature and landscapes on a global scale – and in specific countries. If we take it as a premise that meat production will continue for the foreseeable future, the question is whether meat can be produced in a way that is sustainable in relation to the land, understood as nature, the environment and landscape at once? A prerequisite fact to this question that needs to be remembered is that views differ on what is 'for the benefit' of the land. There is a range of stakeholders whose interests and values may pull in different directions in relation to the question of how and to what extent land is used directly or indirectly for meat production. For example, there are livestock producers who place value on being able to maintain an efficient and rational production. There are various recreational users, such as joggers, hunters and fishermen who value being able to roam the countryside pursuing their special interests. And there are groups, such as nature conservationists who may claim that they not only speak for their own interests, but also on behalf of nature and/or future generations. So what do we – as a society with multiple views and values – want with meat production, and with land, in the light of what we know about the impact of meat production on the rest of the planet? The answer to this question is part of a very complex ethical discussion – a discussion, we will argue, should be conducted in a more realistic, fruitful, open and fair way than it presently is. This paper discusses five 'modest' points to consider in relation to this ambition.

Keywords: land, citizens, impact, livestock, values

Introduction

In many parts of Europe, the use of the open countryside is faced with two opposing tendencies. One is called multiple-use of the countryside where recreational use, agriculture and rural housing communities seek to co-exist. The second trend is the industrialized countryside – also called deregulated agriculture. Twenty to thirty years ago farmers kept livestock, today it is referred to as producing e.g. pigs. But although a higher number of animals than ever are produced each year, animals are much less visible in the landscape than earlier. Evidently how we produce meat has impact on how the countryside appears, the condition of nature, and how the environment is influenced (Gjerris *et al*., 2011; Deckers, 2009). The latter to a degree where due consideration is now given to the introduction of a greenhouse gas tax on animal food products (Wirsenius *et al.*, 2011). However, both the visible changes and the intensified impact of animal production on the land have largely been driven by economic interests and not societal decisions. But as the problems of the production begin to get public, awareness the need for societal dialogue about the use of the land rises.

In this paper we will use 'land' as an overall term, but use the three terms more or less interchangeably, although countryside often refers to the landscape as an area (such as a meadow), nature often implies the biological world (typically animals and plants), and environment refers to the biophysical environment (particularly air, soil and water).

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The paper discusses the opposing tendencies of land use by first describing how meat production directly and indirectly influences its surroundings, using the case of pork production in Denmark – a huge pork producer seen in relation to its modest land area – and then set up five general points for discussion that we believe are necessary to recognize, if the discussion of meat and land is to be constructive in a democratic and pluralistic society. A: That it is impossible to return to a romantic depiction of rural peace. B: That sentimentality has a detrimental effect on the discussions of meat production. C: That livestock production takes place in a sector subject to powerful market forces. D: That the discussions about meat production, specifically what kinds of concerns about the land that are to be taken into account, are part of a more fundamental value discussion about the rights of nature and the right to nature. E: In discussions about more sustainable livestock production, which due to the impact of animal production on climate change transgresses national borders, it is necessary for a fruitful discussion that all participants recognize the right of all to have their view-points discussed, although not necessarily respected.

The impacts of meat production

Livestock production – in competition with other type of food production, or use of the land for producing feed or energy, cf. Ilea (2009) and Nonhebel and Kastner (2011) – is on a global scale directly or indirectly (through the impact on climate, air, soil and water) affecting the environment. If we take the latter as an example, worldwide, meat production requires large land and water resources. Agriculture is responsible for a total of 70% of global freshwater consumption, which in some places (there are big regional differences) contributes to putting scarce water resources under pressure. This bearing in mind that demand for drinking water and water for other purposes is expected to increase by approximately 50% in 2030. According to a statement from the international environmental organization WWF, on average (with large deviances) it takes 15,000 litres of water to produce 1 kg of beef, 4,000 litres to produce one kg of pork and a little more than 1000 litres to produce 1 kg of grain (Frese *et al.*, 2006).

Moreover, livestock production is known to be contributing to deforestation, changes in savannas, drainage of wetlands and desertification (Steinfeld *et al.*, 2006), hereby affecting ecosystem services (Norris *et al*., 2010). An example is the Brazilian beef imported to Europe.. This meat is produced on pastures where until recently forest or savannah took up the land. Besides the sheer size of the area being converted from nature to pasture in South America, studies have shown that 60% of the expansion of grazing areas into woodlands occurs in a manner that threatens habitats. But not only conversion into pastures plays a role (UNDP/UNEP/WB/WRI, 2000). In fact, use of land for growing feed for production animals is one of the areas where livestock have the largest (indirect) effect on nature (Steinfeld *et al.* 2006).

Furthermore, local meat production in Europe, which is to a large degree dependent on the import of animal feed (mostly soybeans), can have considerable negative impacts on the landscape in other parts of the world, particularly South America. In Denmark, even though most of the feed used in Denmark is grown in Denmark and uses up 80% of the available agricultural land, the Danish agricultural area cannot sustain the number of animals produced each year which means that large amounts of feed is imported. Mostly soy in the form of soybean cake, which is relatively inexpensive and which is primarily used for protein feed in mixture with wheat and barley for pigs. Most of the 2 billion tons of soy annually imported to Denmark, come from Argentina (70%) and Brazil (18%), equivalent to a production area of some 900,000 hectares or nearly a third of the Danish agricultural area. In South America, land used to produce soybeans have doubled over last twenty years with the consequence of the loss of over two million hectares of forest and savannas each year – and with them a number of valuable natural areas and species not found anywhere else in the world.

When it comes to the influence of livestock production on the diversity of animals and plants, there is somewhat of a surprise – in some parts of the world, especially in Europe. While in many parts of the world like South America and Africa, livestock production is considered to be one of the driving forces of biodiversity loss, in Europe some forms of livestock production are seen as a prerequisite for the conservation of animals and plants that are endangered because of habitat loss due to *lack* of grazing (Ejrnæs *et al*., 2011). This loss is partly because of the major structural changes that have taken place within the agricultural sector in many countries in Europe in the last 50 years, showing a move from diversified farming to more specialized production systems with increasing efficiency and intensification (*ibid.*). Influence of meat production on the land thus depends on the local context and what kinds of livestock are involved.

When it comes to the impact of livestock production on the countryside, three different 'typical' land uses can be discerned in Denmark – subject of course to local geography, focusing on multifunctional use of the open countryside, where several uses and types of ownership co-exist:

1. In today's' typical pig farmer landscape, intensive pig production takes place in large units where the animals are not or only slightly visible in the landscape. A the same time only a third of Danish dairy cattle ever see the light of day (Videnscentret for Landbrug, 2012), which contributes to a relatively 'closed' landscape with few meadows and other open spaces. Finally the use of more than 80% of agricultural land for growing forage crops gives the landscape scenario in these areas little visual variety.
2. Within a more 'organic orientated' land use, the landscape is characterized by small fields, multiple rotations and hedgerows with animals being more visible in the landscape. The landscape appears more mosaic with only few large forest plantations, typically to benefit the wildlife. This landscape could also arise from a 'part-time farmer' livestock production.

Five points about the discussion of land and meat

There is no doubt that meat production substantially influences its surroundings. This forces modern societies to make more conscious decisions about what they want to do with meat production (e.g. Foer, 2009) and the land that it depends upon.

This is a discussion where both specific stakeholders (such as farmers, nature preservationists, environmentalists and outdoor organizations) and citizens in general have a role to play. Some of the questions are: Is it important to preserve what is aesthetically preferable? What changes are reasonable to demand of the people and organizations that effect and / or are affected by livestock production? In making up one's mind about such complex questions (although stated a bit simplistic here), the following five points should be considered. To avoid becoming too abstract, we consider these points in the context of Danish pork production.

1. To get a more *realistic* discussion, it must be recognized that the romantic depiction of the rural life of the past can never be brought back (if it was ever there). There are no signs that Danish agriculture can return to the state that is depicted in romantic visions of a rural idyllic husbandry. Production methods, the economic structuring of agriculture and the demand for more and more meat for less and less money prevents that. As long as there is a demand for meat in the quantities currently consumed (and no political will to limit this demand through regulation, taxes, etc.) it must be presumed that the intensification of agriculture that has taken place since the Second World War will continue, thus questioning the responsibility of a North Western country like Denmark in relation to an increasing world population and in the light of demand driven livestock revolution of people in upcoming economies who are likely to increase meat consumption with rising living standards.

2. To get a more *fruitful* discussion, the participants should clarify the ethical, social and cultural context of their own values. When evaluating the two types of countryside presented previously, there are underlying value assumptions at play about how the land should be used. This is very visible when one sees how differently we perceive the land. The many different ways can be generalized into e.g. perceiving the land as as a 'frame for (traditional) production activities' or as a 'frame for less intensive production activities' – or, in the latter type of landscape, emphasis is on preservation of nature and landscape and less on the presence of human activity and enterprise. The lack of human presence is perceived as enriching for the person walking in it (for example due to an abundance of wildlife), but it could also be perceived as 'limiting' and even as lacking life (due to e.g. abandoned farms). When land is perceived as a 'frame for activities' the development and enterprise of e.g. industrialized livestock production may be valued as positive. But the active uses of land run the risk of loosing out on nature and environmental values. It should be noted, though, that the contrast might not be as strong as presented here. In many European countries, there are parallel trends in the use of the open country, where high-tech farms, slurry tanks and overgrown meadows do co-exist with organic farms and various forms of 'part-time' agriculture and more recreational uses such as biking, running, hiking, etc.
3. To get a more *transparent* discussion for us all as both citizens and consumers, it is important to realize that we are talking about meat production as a business subject to market forces. Farmers have to make money to stay in business and are dependent on their customers to be willing to pay the price. On the other hand the consumer choice is (at least partly) decided by what is on the market, by commercials from the meat industry, etc. There is little doubt that the market forces have been a driving force in creating many of the problems we see with the negative impact of meat production on the land. It is, however, an open question whether the same forces will be able to help to solve some of the problems. To some, agriculture is a business like any other business and problems should be left to the market. If people find the problem serious enough the market forces will eventually solve it. Others will argue that legislation, voluntary stakeholder agreements and policy must play a significant role. As seen in the case of animal welfare, the mechanisms of the market often seems to focused on short-term human interests to solve the issues at stake (Foer, 2009; Pluhar, 2010). Thus it becomes a debate which also touches upon the relationship between citizens and consumers and a debate about what sort of economic and/or legislative systems are best adapted to solve the issues.
4. To get a more *open* discussion, the debate about how meat production should be carried out – and specifically what kinds of considerations should be taken within the livestock sector towards different aspects of the land – should be seen as part of a larger value discussion about the rights of the land and the right to the land. It is obviously reasonable to demand that arguments and decisions about the use of the open countryside and the impact of different forms and extent of livestock production should be based on solid knowledge. But science can not stand alone when the future of meat production and land is determined. Moreover, it is essential that all parties in the discussion consider and state the value-based assumptions underlying what they think is or should be an acceptable land use. This goes both for the discussion of rights belonging to certain groups of humans to decide the use of the land and the discussion related to the environmental ethical question of whether nature and land has an ethical importance in itself that limits human use.
5. Finally, to get a more *fair* discussion when considering aspects of a more sustainable livestock production and use of the land – a discussion which goes beyond national borders – it is important that all parties acknowledge each other in the sense that all have a right to be heard and respected as stakeholders – even those that one disagrees the most with. Certain groups such as those having commercial interests or animal rights activist cannot be excluded on beforehand because other participants find their viewpoints extreme. If the debate is to lead to socially robust results, it must respect all participants – even though it might not end up respecting their viewpoints

Conclusions

The production of meat has a huge impact on nature, the environment and the way that the landscape looks. Deforestation, climate change and animal welfare are just some of the very important issues related to meat production. It is therefore necessary to take the time to a broader societal discussion about what we as citizens and societies would like to happen. Shall we continue the current development with increasing intensification of most and niche productions based on a much more extensive production system or do we want to change fundamentally the way we use the land?

This discussion is not only of interest to the specific stakeholders within the animal production system: farmers, industry, animal scientists, NGOs focusing on environmental and/or environmental issues, etc. The discussion is, because of the many areas that livestock production influences, a broader societal discussion where the most important participants could be said to be the citizens.

If seen as a prerequisite that the discussion is to take place in a way that respects the pluralistic and democratic culture of e.g. a country like Denmark. To ensure this we suggest some points that the participants should recognize as a common background to the discussion and as some deeper lying issues that the discussion will inevitably touch upon. One cannot discuss the future of meat production and future use of the land without touching upon e.g. the role of the market forces in the societal regulation of meat and land.

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Fewer burps in your burgers or more birds in the bush?

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Abstract

Methane emissions from cattle and sheep have gained increasing profile in the context of climate change. As well as reduced consumption of meat and dairy products, a range of different technical solutions have been suggested as providing ways of reducing these emissions. These solutions include use of genetic selection, changing varieties of grass, use of feed additives, or use of vaccines to change rumen bacterial composition. However, beef and sheep farming in the UK is focused on upland areas where preservation of biodiversity is important and where many farmers have developed direct customer bases by selling 'naturally' produced meat. Many of the technical solutions offered appear to contradict these biodiversity and 'natural product' drivers and support more intensive production systems. At the same time increasing concerns about food security provide another driver to farming practice. The ethical question then is, how do you balance these often contradictory requirements? This paper will use data based on interviews with 42 UK beef and sheep farmers and industry representatives to tease out their views on these questions. I will demonstrate that the threat of methane production and its impact on the climate is not seen as credible by beef and sheep farmers; methane from grass-fed animals is not viewed as a pollutant. Furthermore, many of the technical mitigation methods offered lack appeal in hill production systems because of their perceived negative impacts on other desirable outcomes. More intensive beef production systems are, however, amenable to these techniques. A number of difficult ethical trade-offs are raised when considering how best to address methane emissions from sheep and beef cattle.

Keywords: beef, sheep, methane, greenhouse gas, biodiversity

Introduction

The contribution of animal production to climate change has recently come into the spotlight. In the UK, all of agriculture accounts for an estimated 9% of total greenhouse gas (GHG) emissions (Committee on Climate Change, 2011). The UK Government is committed to reducing GHG emissions by 80% of 1990 levels by 2050 (Climate Change Act, 2008). As part of this, various sectors of the economy, including agriculture, have been allocated interim targets to meet. In the case of agriculture this amounts to around 3% reduction (relative to 2007 levels) by the end of 2012 and subsequent further reductions. The main direct sources of GHGs from livestock are nitrous oxide from livestock excreta and methane from ruminant digestion. Around 36% of agricultural GHG emissions are accounted for by methane (Committee on Climate Change, 2011) and methane emissions are the focus of this paper.

A number of different technological solutions have been suggested to enable reductions in methane emissions. These include output efficiency measures such as genetic selection for improved growth rate and efficiency of feed utilisation, as well as general increases in efficiency through improved animal health and reproduction. Various methods of manipulating rumen bacteria to produce less methane have been also been suggested. These include changing grass varieties or using feed additives and vaccinating to change the rumen microflora.

While different approaches for measuring greenhouse gas emissions have been suggested (Garnett, 2011: S27), the most commonly quoted in policy documents is the Lifecycle Analysis approach which

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measures greenhouse gas impact per kg of product (e.g. meat or milk). Life Cycle Analyses have been used to evaluate the most effective methods of reducing GHG emissions. For example, Life Cycle Analysis developed by Cranfield University (Genesis Faraday Partnership, 2008) was used to model the effects of changes in performance for a number of different species. This identified, for example, that in order to produce one tonne of pig meat over 4 tonnes of greenhouse warming potential is produced, as compared to nearly 15 tonnes for beef and nearly 16 tonnes for sheep, thus highlighting the important greenhouse gas contribution of sheep and beef cattle. Similarly, Marginal Abatement Cost Curves have been used to evaluate which specific measures are the most cost effective (Moran *et al*. 2011). These kinds of calculation have identified economically attractive ways of achieving GHG emission reductions, for example using genetic selection. This Life Cycle Analysis, economics and production-oriented approach has also been adopted by industry as a way of road mapping a path to lower emission agriculture (Industry Delivery Partners, 2011).

The research reported here, funded by the UK Economic and Social Research Council, sought to examine beef and sheep farmer views of adopting different methods to reduce GHG emissions and in particular to understand why do UK sheep and beef cattle farmers adopt genetic selection techniques at a rather slow rate as compared to poultry and pig farmers (Garforth *et al.* 2003)? And is this likely to change given the context of climate change and Government imperatives to address methane emissions?

Research method

Semi-structured interviews were conducted with 42 respondents including 30 sheep and cattle farmers and 12 representatives from the wider agricultural industry (e.g. meat industry, vets, consultants, etc.) from around the UK. Questions focused on how replacement animals were chosen, how breeding decisions were influenced by markets for breeding animals and meat, the perceived importance of environmental issues and more specifically the role of methane. Farms covered a wide-range of sizes, selling to different markets (e.g. pedigree animals, meat for supermarkets, meat for direct sale, organic production) and different physical environments. Interviews were conducted between September 2010 and March 2011, primarily face-to-face on farm, although a small number were undertaken as telephone interviews for logistical reasons. Interviews were taped (with permission), transcribed and then analysed inductively, seeking to identify themes across the interviews. Interviewees were identified by a range of different informants in order to avoid interviewing only people well-known in the industry. A specific strategy was to target several different geographical areas, for example hill farms in the Highlands of Scotland and lowland pasture in the South of England, again to provide diversity. The interview data are not intended to be statistically valid samples but rather as an engagement with as wide a range of views as possible. Results are presented under three broad themes: the concept of methane as a pollutant, the importance of whole systems and tensions among ethical drivers of sheep and beef production.

Is methane a pollutant?

Typically in the broader culture, agriculture is presented as a problem when it comes to action on climate change, and the role of methane as a potent greenhouse gas is highlighted. The farmers interviewed for this project however, viewed methane in a very different way. They saw methane as a natural and inevitable part of producing sheep and cattle, for example one beef farmer commented 'animals grazing grass are part of the whole balance on the planet.' (interview 34). They felt the science of methane emissions to be in its infancy with the danger of taking action that will later prove to have been harmful. They did not find figures quoted for methane emissions, particularly from grass fed animals, to be credible. For example one sheep and beef farmer noted 'Those lambs are outside all year round, they're eating grass, they're for all intents and purposes as close to nature as the majority of sheep are in this country and yet we're still given a carbon footprint of nearly half a tonne per lamb' (interview 114).

Furthermore, they saw that animals fed on grass made use of a natural product which absorbed carbon and that this carbon capture element was not being recognised and rewarded adequately. Some interviewees felt that in focussing on methane farmers were being made scapegoats for the carbon emissions from rest of society, particularly related to transport of food in supermarket supply chains, driving cars and flying. Thus, farmers did not feel part of the problem as emitters of greenhouse gases; rather they felt part of the solution in capturing carbon by growing grass and producing the food that is essential to humans.

Thus, the evidence from these interviews suggest that there is little acceptance of methane emissions from sheep and cattle as a 'problem' requiring action by farmers to solve. This message was conveyed remarkable consistently across all the production systems, including those with an inherent ideology of environmental care, such as organic farms.

The importance of systems

The farmers interviewed consistently talked in terms of their production system. They referred to having developed systems which were appropriate for their environments, labour availability and the markets they were aiming to supply. The available technologies (genetics, feed additives, etc.) were then viewed in the context of these different systems. For some, particularly commercial beef farmers who took a production-oriented or 'productivist' (e.g. Winter, 2005) approach, many of the technologies fitted into their system. So, for example, most had already adopted genetic selection and were open to changes in grass varieties or use of feed additives. However, for others, the actions advocated from a Life Cycle Analysis-economics approach was perceived to increase intensification of production, something that was not always welcome.

Many farmers did not see themselves as merely economic actors (while still needing to make a profit), for example one large beef farmer producing for supermarkets noted that 'We could easily double, treble the size of the farm now, and farm it a lot harder, but that's not what we want to do' (Interview 95). The range of sheep and beef production systems found across the UK, reflect its hugely variable geography, including mountains and moors as well as pasture and salt marshes. These differing environments have an impact on farmer priorities and many GHG mitigation measures were viewed as unsuitable. For farmers in upland or hill areas, a key aspect was the ability of the animal to perform in very challenging environments often on poor grazing and in harsh weather. The perception of many was that animals with 'improved genetics' would not thrive in these harsh, hill conditions. The topography was unsuited to sowing grass, negating the prospect of using less GHG producing grass varieties. Animals (particularly sheep) were primarily grass-fed and received little additional feed making the use of feed additives inappropriate. Many upland farms are highly dependent for income on payments for managing the environment by grazing, often to support specific biodiversity, particularly birdlife and plants. These payments stipulate management conditions and farmers interviewed noted that that some of the schemes would not allow additional feed to be given to animals, and hence feed additives would not be a method they could adopt.

Many farmers sell meat directly to consumers. Among this group of interviewees, there was reluctance to using either feed additives or vaccination as a means of reducing GHG emissions. The perception was that consumers would not find these approached acceptable. Furthermore, this group of farmers viewed meat quality as an important aspect of their sales. Many viewed meat from slower growing animals as of better quality than meat from faster growing animals and hence judged that selecting for increased growth rate was not necessarily the best for their business.

The association between the measures suggested to reduce GHG emissions and intensification of production were problematic for some farmers (notably, but not exclusively, organic farmers).

For some, the finding that more extensive production systems were more damaging from a greenhouse gas point of view than more intensive systems was unwelcome, and often caused them to question the way in which calculations had been undertaken. Their values suggested that whilst climate change was an important consideration, intensification was the wrong direction to go in. They preferred a whole farm approach to carbon with more emphasis on grassland and particularly soil management, as well as the role of trees in carbon sequestration. Others feared that more 'efficient' production would only result in increasing numbers of livestock and no net reduction in GHG emissions. Again and again, farmers referred to the 'naturalness'of their production systems and the way in which ruminant animals have a useful purpose, particularly in upland areas.

The different production systems thus have a profound impact on the factors considered important by individual farmers. For many commercially-oriented farmers, production efficiency is important (with its associated reduction in methane production) but other farmers have strong drivers from the particular production system they are in, which give much less emphasis to production efficiency.

Conflicting ethics

It was clear that a number of conflicts among ethical 'goods' arose in these interviews. The key conflicts are identified as follows:

- food production vs. climate change;
- biodiversity vs. climate change;
- naturalness vs. efficiency;
- responsibility of farmers vs. responsibility of wider food chain and consumers;
- reduced animal production and social impact on rural populations;
- potential conflict between measures to reduce methane emissions and animal welfare.

Many interviewees saw an inherent contradiction between production of food and reduction of methane production, for example one interviewee noted 'I think we have to weigh the two up and decide whether or not we want to have food and whether or not we want to be seen to be very environmentally conscious, and at some point there has to become a balance' (Interview 33 dairy/beef farmer). This was not to imply that environmental factors were unimportant to farmers, on the contrary, they were often considered very important, not least because the economic impact environmental schemes have on the profitability of farming enterprises. Rather, the question raised was one of an appropriate balance.

As noted in the previous section, conflicts were perceived between the methods suggested for reducing GHG emissions and maintaining biodiversity and the perceived 'naturalness' of food. There was also a perception that consumers would not be prepared to pay more for food produced with a lower carbon footprint e.g. 'When you talk about your meat, saying low carbon footprint doesn't really register with people, saying all grass fed registers people much more than low carbon' (Interview 112, organic sheep and beef producer). Many of the farmers felt they were being unfairly targeted in terms of GHG production, often highlighting the amount of transport in order to access slaughterhouses and within supermarket supply chains as being at least as worthy of attention.

The limited range of economic options for people living in upland areas was often raised. Some feared that should beef and sheep production decrease drastically, losing this 'backbone' of activities would impact on others, including key infrastructure e.g. 'And one of the problems I have is looking at the sustainable future of our upland areas...We're already seeing examples of that in loss of housing, loss of early infrastructure, walls and so on.' (Interview 20, vet).

Finally, there was some nebulous and unformed concern that manipulating the complex biology of animals by genetic selection for less methane producing animals or altering rumen bacteria by vaccination, could have unexpected and unwanted consequences that could potentially result in harm to the welfare of the animals. There was widespread scepticism of 'scientific expertise' with experiences of Bovine Spongiform Encephalopathy ('mad cow disease'), Foot and Mouth Disease control measures and various environmental schemes cited as evidence of where 'scientific expertise' has proved wrong.

Discussion

The UK government has indicated its intention to reduce greenhouse gas emissions. Furthermore, a number of actions have been identified primarily from the scientific community, that it is suggested would provide win-win actions for farmers in terms of both reducing methane emissions and increasing profitability. However, the increasingly complex requirements for agriculture to meet aspirations in food production, maintenance of ecosystems and now mitigating climate change requires a difficult balancing act to be achieved. Evidence is presented here that sheep and beef cattle farmers in the UK are aware of these complexities and responsive to them. However, the 'technical fix' approaches are only partially appropriate and most suited to a sub-set of production systems. Alternative strategies have been discussed, for example reduced consumption of animal products (e.g. Committee on Climate Change 2011; Garnett, 2009), and reducing food waste, particularly in households (e.g. Committee on Climate Change 2011).

Different ways of identifying a suitable balance between these different aspirations have been advocated. Garnett (2009) suggests developing systems that provide maximum nutrition for minimum greenhouse gas levels. Gill *et al.,* (2010) suggest considering efficiency in terms of human-edible food produced per unit of human-edible food consumed, whereby ruminants are credited for their ability to eat grass and other products not consumed by humans, in contrast to pigs and poultry which are more likely to compete with humans. Many of these approaches seem compatible with each other. Twine (2010) in contrast argues that altering consumption patterns and scientific efforts to increase efficiency are incompatible 'If, as I argue, we can note an emerging consensus around mitigation policy for a decrease in meat and dairy production, then we must conclude a corresponding delegitimization of animal biotechnology in a productivist, output-enhancing role' (p174).

It may be that a more effective strategy would be to focus on allowing different farming systems to build on the strengths of their system, whether for food security and mitigating climate change from production-oriented farms, maintenance of ecosystems from farms in appropriate areas, or providing locally-produced food. Might it be possible to encourage a range of systems of production that could emphasise different aspects of the challenges depending on individual farm location and circumstances? Rather than evaluating which type of production system is the best, could we rather see how they can complement each other? Rather than attempting to make all farms similar, could we view the variety as a strength? Given that nature is diverse, a range of solutions appropriate for different environments, regions, animals, feed sources and so on, could be seen as respectful of the diversity of nature and the complexity of the living world.

Conclusions

Methane emissions from sheep and beef production are an important source of greenhouse gases but livestock are also important in provision of food, economic activity in rural areas as well as management of land to maintain biodiversity. Technical methods to reduce methane emissions have been suggested and evaluated on their economic impact but many are perceived to be in conflict with other 'goods' being produced by livestock agriculture. Individual farmers resolve these tensions according to their

own circumstances and values but there is a role for wider reflection on what it is that we want from agriculture. Developing alternative model systems of production that allow individual farmers to focus on food security, climate change mitigation or biodiversity management as is most appropriate in their specific geographic location and circumstances might be an appropriate response to consider.

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Inconvenient truths and agricultural emissions

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Abstract

The near-universal scope of sustainable development and climate change inevitably brings ethical dilemmas. A means to address an environmental problem in one area may conflict with policy goals in a different field. How should we handle conflicting ethical values or principles in pursuit of these key objectives? This paper examines two such ethical dilemmas which arise out of Ann Bruce's study on reducing methane and nitrous emissions from ruminant livestock to help to lower overall greenhouse gas emissions, which have a wider significance than agriculture. Firstly, her findings suggest that among the most effective measures to reduce livestock emissions may be to move further towards intensive production systems. This conflicts with key ethical goals in sustainable development, adopting more extensive production and maintaining biodiversity. Does climate change therefore provide a higher ethical value, requiring the reassessment of some 'sacred cows' of environmental ethics? A similar case has arisen with proposals to increase nuclear power to reduce fossil fuel emissions from electricity generation. The paper considers how we should prioritise environmental principles in the real world, and how far ethical principles can be compromised in the light of their adverse impacts.

Keywords: ethical dilemmas, livestock emissions, sustainable, negotiable

Introduction

Former American vice-president Al Gore was instrumental in producing a well-known film on the dangers of human-induced climate change, entitled 'An Inconvenient Truth'. Its ironic title reflected the conflict involved in calling for urgent measures to reduce greenhouse gas emissions, against the prevailing American economic and political culture reliant on massive use of abundant and cheap fossil fuels. The idea that to maintain a planetary climate suitable for human flourishing system meant putting a break on energy demand and reducing fossil fuel use, was, in a notable piece of understatement, an inconvenient truth.

The growing awareness of the seriousness of climate change has generated an ethical mandate which challenges a number of strongly held ethical principles, of which the virtue of increasing economic consumption is only one. This paper examines two other ethical challenges, both of which arise out of Ann Bruce's paper for this conference on reducing methane and nitrous emissions from ruminant livestock to help to lower overall greenhouse gas emissions, which have a wider significance than agriculture (Bruce, 2012).

This highlights a more general question in any system of ethics a problem, when the driving factor of one line of moral reasoning comes into conflict with another driving factor, which could seem equally strong and valid, had one started with that factor instead. The paper considers how far ethical principles can be compromised in the light of their adverse impacts, and how we might prioritise environmental principles in the real world.

No ethical free lunch

There is a tendency in environmental rhetoric that there is such a strong imperative to promote a concept like biodiversity, or take action to reduce greenhouse gas emissions, or to oppose a technology

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like genetic modification, that these become elevated to the status almost of moral absolutes. Applying environmental ethics to real world situations, the situation is more complex. One policy to mitigate or overcome an environmental problem may exacerbate another. This is especially highlighted in the concept of sustainable development. By bringing together the diverse domains of economic, environmental and social development, conflicting policies and conflicting ethics are perhaps the norm rather than the exception. Similarly in energy policy, in seeking alternative to fossil fuels, there is no 'free lunch' because any proposed measure brings with it other ethical problems.

The problem of competing criteria was highlighted in a critical assessment of the EU's sustainable development and energy policies of the mid-1990s by an expert working group of the European Protestant churches (Bruce and Pickering, 1995). Competing directorates within the EC organization emphasized different priorities according to their underlying values. At that time, the churches considered that the ethical balance was weighted much too strongly towards the ethics of neo-liberal economics, at the expense of the imperatives that arise from environmental and social criteria.

Agricultural emissions and their reduction

Similar problems occur in the area of emissions from agriculture, and in particular farm animals raised to provide meat for human consumption. In recent years it has emerged that methane and nitrous oxide emissions from sheep and cattle, in particular, is a significant contributor to UK greenhouse gas emissions, globally and nationally (Committee on Climate Change, 2011). The relative magnitude of the emissions is highly dependent on national and local contexts, and variable factors such as how much feed and fertilizer is used, and the types of land relative to other potential uses. But it is generally expected that this source of greenhouse gases is likely to increase considerably on a global scale, if emerging economies, such as India, China and Brazil, follow the same route to western cultures of demanding a much higher proportion of meat in the regular diet of the population.

If farm animal emissions are thus seen to be a contributing factor to climate change, then it follows that we should aim at some degree of reduction of these. Ann Bruce lists several technological solutions to reduce methane emissions (Bruce, 2012). These include direct measures such as manipulating rumen bacteria, using feed additives, and changing grass varieties. But one of the most effective means is the indirect one of simply improving output efficiency. The logic is that methane emissions per head of animal would be reduced by increasing the efficiency of meat production from a given animal. Typically, output efficiency is increased by faster growth rate, less feed per unit of growth, higher fertility and fecundity, and less disease incidence.

An ethical conflict

Such an approach would naturally be welcomed by animal producers, as an unexpected ethically beneficial side-effect of economic efficiency. But it cuts against the grain of the ethos of a more environmental sustainability in agriculture, which looks generally to adopt more extensive production methods. Those advocating a more environmentally sustainable and animal welfare friendly agriculture tend to regard the prevailing emphasis on higher production efficiency as part of the root cause of the problem. In this view, 'intensive animal production' is considered as what has made agricultural practices unsustainable. Garnett lists various arguments against more intensive production, which are presented as ethical drawbacks. These include lower animal health, fertility and welfare, higher mortality, and in increased soil and water pollution (Garnett, 2011).

To advocate increasing livestock production efficiency as an important means to reduce methane emissions from agriculture would seem to conflict with certain key ethical principles and goals in

sustainable development. There is thus an ethical dilemma. To give an incentive to intensive animal production would seem incompatible with a policy intended to safeguard the environment. Yet it can be argued that it would help to reduce one of largest threats to both the environment and human societies, namely global warming. A somewhat similar situation has arisen with proposals to maintain or even increase the scale of nuclear power, to facilitate the reduction of fossil fuel emissions from electricity generation.

There are conflicts within a policy of increasing production efficiency. For example, less fertile or suffering animals are less productive, and thus relatively more methane producing than healthy ones. Such factors would representing efficiency limits beyond which the net greenhouse emissions reductions would diminish. Carbon accounting could be an important internal constraint on the policy, which could call to account producers who would simply pressed to increase production output efficiency, under the guise of climate mitigation.

But a deeper ethical challenge lies in a more basic considerations for animals themselves and profound concerns for the environment. These, in turn, may also expressions of an underlying world view which holds to a much less manipulative and interventionist view of nature, and within which high regard is taken, for example, not only for the welfare but also the integrity or intrinsic value of animals.

Negotiable or not?

How do we handle such conflicts of ethics? Climate change has put a disruptive ethical spanner into the status quo of environmental policy and ethics, challenging some strongly held principles. It is important to ask, in the light of this situation and the new dilemmas it throws up, are long held ethical concepts like extensification or animal welfare/ integrity immutable principles, or important concepts but negotiable ones, depending on what other factors may also have priority. Are these negotiable or sacred cows?

A helpful insight comes from the far-reaching 1995 UK Banner committee report on emerging animal genetic technologies, which suggested three ethical principles (MAFF, 1995). There are harms to animals of such degree that they should never be allowed; some harms which may be justified but only if outweighed by the good which is realistically sought; and in such cases harm should also be reduced as far as is reasonable. If extensification and its related issues are seen as non-negotiable, they are in Banner's first category, as things that must not be compromised. If they are open to assessment, they are in the second, to be weighed up against other prevailing factors, and always with an overall obligation to reduce harms.

Sacred cows – the non-negotiables

We consider first the idea that concepts like extensification represent basic principles which cannot be compromised, even in the face of so powerful an ethical impulse as climate change mitigation. If increasing efficiency in meat production from animals is regarded as absolutely incompatible with sustainable agriculture, it is important to be sure what are the grounds for the opposition. In particular, what were the factors which led to this critical stance arise emerging as a touchstone of environmental ethics in this field? Do the criticisms remain valid now, and in which circumstances? Serious concerns at one period of time can become established as universal, immutable principles, as if to say 'This is an example of how things are in all forms of (in this case) intensive agriculture, and they always will be this way.'

But they may not be universal, but be contingent on circumstances which may not apply in another country or place, or at a different time or context. The engineering ethos of mass production applied

to livestock has certainly produced much bad practice in relation animal welfare, pollution and other issues, which are widespread and hard to counteract. But the sheer diversity of animal agriculture does not admit readily to making this a universal norm. Efficiency need not equate to all the ills commonly associated with intensification.

Moreover, these may not be unchangeable problems, but may be open to corrective action. This is illustrated by a phenomenon which may occur in the context of environmental campaigns. In criticising the acts of an organization like Shell or Monsanto, in a particular historical context, it has been easy to demonise, treating them evermore as symbols and icons of what evils the environmental movement stands against. The environmental movement has been less good at certain Christian virtues of looking for the possibility of redemption, rather than merely looking in order to damn, and of acknowledging – and to that extent forgiving – if some measure of a changing of ways has occurred.

The elevation of a policy opposition into a non-negotiable principle often relates to a world view and the type of moral reasoning which stems from it, and also to factors to do with the social context of the issues, in relation to the values and interests of particular groups of people or organizations (Bruce, 2011). Within such world views, a notion such as extensification in agriculture or opposition to nuclear power, may assume something of the status of a universal or fundamental principle. This may in turn become a defining characteristic of a certain social group, or a fundamental article of an organization based around such a world view. This may even assume something akin to the status of a credal statement in a religious tradition – something which would be unacceptable for someone to deny and at the same time remain a member of that community.

Thus when prominent 'saints' in the environmental community such as James Lovelock or George Monbiot have publicly advocated heterodox views in favour of nuclear power, it can be seen to the faithful as something of a betrayal (albeit that Lovelock had made no secret of his support for nuclear power for many years). But it may be argued that the heterodox have not necessarily 'lost the plot'. They may have recognized that certain principles cannot hold the weight that has been put upon them, because treating them as non-negotiable absolutes can sometimes have very real negative consequences.

This leads to the conclusion that if particular ways of doing agriculture, which are inherently opposed within some world views, actually provide a better way of addressing climate change than the alternatives, the inherent opposition should be modified. A similarly case may apply to nuclear energy have, in that the risks of climate change are arguably more serious than those from nuclear power, if one was forced to choose between them (Bruce, 2006). In both cases, climate change mitigation is providing a higher ethical value, which requires the reassessment of some 'sacred cows' of environmental ethics. But climate change mitigation must not become a sacred cow, in its turn.

Negotiating with non-sacred cows

If, on the other hand, concepts of extensification and the like, are contingent on having appropriately beneficial consequences, they may be to some extent negotiable, if it can be shown that insisting on the concept has negative consequences to some other ethical concern. The disadvantages of more extensive animal production in producing higher emissions per kilogram of edible product would be weighed alongside other relevant criteria. Such evaluations will be complex and sensitive to such issues as the type of land and its alternative agricultural uses (if any), the extent to which fertilizer is used, or feed and the type of land the feed is grown on, stocking densities and animal health.

This leads to a set of multiple criteria all of which need to be taken into consideration. Ann Bruce identified a number of conflicts among ethical 'goods' from these interviews:

- food production vs. environment;
- naturalness vs. efficiency;
- responsibility of farmers vs. responsibility of wider food chain and consumers;
- social impact on rural populations;
- potential conflict between measures to reduce methane emissions and animal welfare.

Each of these pairs represents an ongoing debate between forces stressing one side or the other. Into such dynamic tensions as these, the imperative to mitigate climate change as a matter of the gravest urgency comes as a disruptive force to challenge the uneasy balance of competing criteria which has prevailed hitherto. Like the situation of a country at war for its very survival, does the new factor assume such supremacy and dominance that all other criteria, such as biodiversity, now take second place? Or does it call for adjustments in all other sectors, but not a revolution?

Who pays for pollution?

For many of Ann Bruce's animal farmers, the answer seemed to be more adjustment and finding an appropriate balance among many goods, rather than revolution driven by the need to mitigate climate change. Part of the rationale came from a second issue arising in her paper. This is that the ethical imperative of reducing climate change was being given too much weight in relation to livestock emissions control, because they were a soft target but not the main cause of the problem. 'Many of the farmers felt they were being unfairly targeted in terms of GHG production, often highlighting the amount of transport within supermarket supply chains as being at least as worthy of attention.' (Bruce, 2012).

The argument is that farmers should not be asked to shoulder an undue burden of a problem that is primarily not of their making. If the major cause of increased global warming is fossil fuel energy and transport emissions, the relevant polluters should surely pay first and most. It would not be fair to penalise more moderate emitters to the same degree, just because of the excesses in other sectors. In so far as grazing animals naturally produce methane, and meat eating is seen as a natural human activity in most societies across the globe, livestock emissions should only be reduced in so far as these have also increased substantially in recent times. The issue is one of relative scale, rather than absolute source.

But is this objection overruled, if the resulting problems of climate change are now so severe that every reasonable measure may be needed even to reach targets short of what is required? If so, much care is needed to ensure that a shared ethical burden falls sensibly and fairly, and does not end up stimulating the wrong policies. This can be illustrated by considering various policy measures to reduce greenhouse gas emissions:

1. the same percent reduction in all sectors and departments, across the board;
2. reductions weighted to the sectors which contribute the most to current emissions;
3. reductions in all sectors in which it is feasible to make reductions;
4. reductions weighted to sectors primarily responsible for the historic increases;
5. reductions in all sectors where it is feasible, but taking account of where the reduction measures would themselves be likely to create significant problems.

The first three ignore the past, and simply call for solidarity in the present, spreading the burden across (1) society; or (2) to the present emitters; or (3) simply where feasible. These seem to be too blunt an instrument disregarding historic responsibility, and which may place undue stresses on sectors without sufficient sensitivity to context. Option 4, however, takes up the farmers' complaint, and does not place the same burden of reduction as from fossil fuel emissions from energy or transport. Option 5 presents

a better ethical compromise. It recognises that the ethical duty of reparation of environmental and social damage has shifted from the original culprits to everyone, because we are all implicated in past actions, and given the sheer magnitude and difficulty of the problem of reducing emissions.

Conclusions

In view of the seriousness of climate change, some deeply held ethical stances within the environmental movement, such as extensification in agriculture, should now be considered negotiable, rather than absolute. There is an ethical argument for reduction of livestock emissions to play a part in the mitigation strategy but not as strongly as energy and transport sectors. Reduction measures could include a degree of increased efficiency of production, but only if the benefits significantly outweighed the corresponding harms to animals or the environment, bearing in mind the balance of factors that need to be taken into account.

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Section 8. Agro-energy

The ethics of using agricultural land to produce biomass: using energy like it grows on trees

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Abstract

This paper will consider the ethics of using agricultural land to produce biomass for energy. The use of biomass for heat, electricity and transport energy is widely cited as having a role to play in sustainable development by helping to replace finite, polluting fossil fuels with renewable, carbon neutral biomass. Biomass energy has faced much controversy however, as the use of food crops, land and other resources in the production of energy have proven to be contentious. Agriculture supplies us with some of the resources necessary to sustain life and support human flourishing, and agricultural ethics is concerned with how this should be done. This paper will consider in more depth the replacement of a proportion of energy derived from fossil fuels (long expired creatures) with energy derived from biomass through agricultural production. It will explore the idea that the examination of biomass energy use could in itself, make us more aware of our connection with and reliance on our surrounding environment. It will consider different rationales for this view, from agrarianism and the political theorist Hannah Arendt. It will attempt to support this view and suggest that the process of change from fossil fuel to biomass could also prompt deeper societal reflection on our wider energy usage.

Keywords: bioenergy, agricultural ethics, fossil fuel, transparency

Introduction

Before examining the use of biomass for energy it is important to define some of the key terms. The term biomass broadly refers to anything that is living or was once living. This paper will use the term 'bioenergy' to refer to the production of stationary heat and electricity from biomass, 'biofuels' to refer to its use in transport fuels and 'biomass energy' as an overarching term for both.

Bioenergy feedstocks come from a wider range of sources: household waste, wood chips, with a proportion coming from agriculture, such as the extensive use of straw in Denmark, the use of energy crops in the UK and Sweden and the production of energy crops for biogas in Austria and Germany (Danish Energy Agency, 2009; DEFRA, 2007; Intelligent Energy Europe, 2009). The majority of biofuels in their present form come from food crops, either sugars or oils, what are called 'first generation' biofuels (FAO, 2008). There are incentives in many countries for the increased use of energy crops and crop residues in stationary and transport biomass (DEFRA, 2007; DMFAF, 2008) which may put pressure on the availability of land for food production and have negative environmental consequences. Hence biomass derived from agricultural sources can be considered an appropriate topic for ethical analysis within the area of sustainable development.

This paper will focus on the use of biomass that is produced on agricultural land (excluding the potential use of algae in biomass energy, domestic or commercial waste or forestry products) contending that agricultural ethics provides interesting and relevant frames through which to view the broader controversy that surrounds this energy source. Instead of considering different uses of agricultural land – for food or fuel, this paper will look at different sources of energy: fossil fuel and biomass. It will give a brief overview of the development of biomass energy thus far: the reasons for its development,

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controversies it has given rise to and new technologies. It will consider the idea that biomass could make our connection with our surrounding environment more visible. It will consider an agrarian rationale for this view as well as drawing on the analysis of political theorist Hannah Arendt (1958) on how people should interact with the world around them. It will find support for the above view by combining these analyses and apply it to the biomass energy controversy. By making the production of these new forms of energy more transparent this may in turn facilitate a more value-oriented reflective process on current and future energy consumption, alongside the important technology assessment of the new production processes.

Biomass energy: development and controversies

The main reasons cited for the development of biomass energy technology are: energy security, climate change mitigation and rural development. Biomass could contribute to energy security because it could be produced by countries with limited direct access to fossil fuels, or imported from neighbouring countries, and is renewable. Biomass also has the potential to be carbon neutral because carbon is stored in plants as they grow, which is then released when the plant material is burned. Agricultural sectors in developed countries have faced challenging times in recent decades due to rising costs and changing agricultural policies (Angus *et al*., 2009), and thus the production of biomass is seen as a potential stimulant that could aid rural development (FAO, 2008). The EU Renewable Energy Directive (RED) 2009/28/EC stipulates that 20% of member states' total energy consumption should come from renewable sources by 2020 and 10% of transport energy, a proportion of which may be met through increased use of biomass.

While the use of biomass energy is proposed by policy-makers in the EU as a part of a sustainable solution to these problems, a number of controversies and criticisms have dogged its recent development. It is valuable to first note the use of first generation biofuels for transport as this has received some of the most significant attention, and the majority of the criticisms, though not all can be extended to biomass for stationary uses. In common with the criticisms of intensive monocultural food production, intensive biofuels feedstock production, such as palm oil, sugarcane or corn production has been shown to result in substantial negative environmental impacts (Kim and Dale, 2005). It has been shown that biofuels are often not carbon neutral, or can be more carbon intensive than fossil fuels, as land use change means that biomass production results in the displacement of cropland onto land that acts as a carbon sink, such as forest and pasture land (Searchinger *et al*., 2008). First generation biofuels production has been associated with a host of other environmental problems such as loss of biodiversity, soil erosion and degradation, increased water use, eutrophication, species invasion and ozone depletion (Doornbosch and Steenblik, 2007).

Beyond environmental concerns, biofuels has received notable criticism for its claimed impact on staple food crop prices. The perception that biofuels feedstocks disrupted food markets and contributed to food prices increases in 2007 and 2008 lead to extensive debate about the food rights of the poorest contrasted with the desire of the rich to fuel their cars. This issue does not directly apply to the use of non-food crops to produce biomass energy, but as discussed later, non-food crops still utilise the same resources required for many forms of food production. Some organisations maintain that biofuels production could indirectly help to promote food security by benefitting struggling agricultural markets in developing countries (FAO, 2008; Nuffield Council on Bioethics, 2011), but there has been mixed evidence of this thus far, with examples of poor practice by investing companies to the detriment of local communities (German *et al*., 2010).

Since the emergence of these controversies, there appears to have been a change in biofuels rhetoric. As a way of mitigating this criticism there is now an emphasis placed on the promise of 'second generation'

biofuels that extract sugars from non-food crops. These are not widely in commercial production yet and scientific progress is anticipated to lower costs and make the process less energy intensive. Claims are presented about second generation biofuels: that they will give equivalent energy yields with fewer inputs and result in fewer environmental impacts (WGBU, 2008). Potentially more important it is asserted that they will not compete with food production because they are either derived from crop residues or can be grown on 'marginal' land that is not fit or profitable for food production (Nuffield Council on Bioethics, 2011).

Agricultural ethics and Arendt's perspective

A notable analysis of biomass energy within agricultural ethics was presented by Thompson (2007) in which he argued that biofuels were being developed within an overly industrial conception of agriculture, and did not take account of an opposing 'agrarian' view to balance industrial drivers. The industrial view of agriculture sees it as a sector of the economy whose function is to produce commodities as efficiently as possible, whereas an agrarian view maintains that agriculture has a wider cultural and value-laden significance for a society (Thompson, 2010). Thompson's agrarianism is a type of virtue ethics that maintains contact with nature through farming, or at least knowing where our food and fuel comes from, fosters respect for and stewardship of nature, and a sense of place that develops the character (Thompson, 2010). Leopold, an important influence on agrarian thought, stated that there are 'spiritual dangers' in thinking that 'breakfast comes from the grocery and [...] heat comes from a furnace' (Leopold, 1949: 6). Thompson (2007) mentioned the possibility that biofuels could be a way for consumers to reflect on the sustainability of our agricultural systems, and queried whether it could serve to make us feel more in touch with the land. He stated that this is not happening through the current development of biofuels, which does not differentiate between fossil fuels and biofuels.

One can consider this idea in more depth and ask why it is desirable that we are more aware of our reliance on and connectedness to the surrounding environment. Why would it be beneficial if we knew the details of how biomass was produced? Why are there 'spiritual dangers' in being disconnected from our food and fuel? A criticism of agrarianism is that it can romanticise agriculture and view it as fostering harmony with nature, when it may in fact be experienced by farmers as a constant battle with nature, which can lead to disenchantment (McKenna, 2011). To explore these questions we will consider some of the work of the theorist Hannah Arendt (1958) who examines how people do, and proposes ideas on how people should, interact with their environment. She does not romanticise agriculture, but rather draws attention to its negative features that some farmers mentioned by McKenna, encountered: the endless hard work and struggle with nature. Yet she reaches a similar conclusion: that it is necessary and beneficial for a society to know how its food and fuel are produced.

Arendt draws up a classification of three ways of interacting with the world based on an Aristotlian typology. Under her categorisation, agriculture belongs to the activity of labour: making the necessary provisions that sustain life:

> Labor is the activity which corresponds to the biological process of the human body, whose spontaneous growth, metabolism, and eventual decay are bound to the vital necessities produced and fed into the life process by labor. The human condition of labor is life itself (Arendt, 1958: 8).

The category of work corresponds to the activity of making the durable artefacts we use every day and that provide us with a shared and constant social world. Action consists of our interaction with other people and to the creation of works of art; it is a meaningful activity and has unpredictable and far reaching consequences.

The products of labour do not last but are consumed or perish, so there is a need to keep producing them. Arendt maintains that this makes labour the manifestation of our need to keep ourselves alive, which can be a painful process. In the modern context there is a danger that the mechanisation of labour could hide the necessity we are under:

> Tools and instruments ease pain and effort and thereby change the modes in which the urgent necessity inherent in labour once was manifest to all. They do not change the necessity itself; they only serve to hide it from our senses (Arendt, 1958: 125).

According to Arendt, the ancient Greeks viewed 'labour' as a 'painful' existence due to the close contact with the painful cycle of human mortality. Arendt, somewhat negatively, maintains that knowledge of this necessity is *itself* painful despite the removal of the pain from labour, because our need to repeat it means we cannot claim to be whole or complete, but rather are incomplete, dependent and finite. The cyclical process of agriculture is bound up with our own life cycle. We, as individuals who consume the produce of agriculture also perish and are replaced by a new generation who need more of the same, perpetuating the cycle. Warning of this danger is certainly not to advocate pain in labour and rolling back the mechanisation of agriculture but to recognize that even if the *mode* of agriculture changes the *necessity* of undertaking it does not.

Although Arendt view is rather negative, and some might not fully endorse this construction of human existence, aspects of her view are interesting for our discussion of the energy system. Similarly to agrarianism Arendt maintains that the nature of 'labour' should not be hidden or forgotten, because in her view, it is paradoxically through knowledge and acceptance of this necessity that we can pursue our freedom. Arendt believes that we can rise above our conditions, through human 'natality': the creative ability to invent through art or technology. It may be useful to take from both agrarianism and Arendt's analysis the knowledge that sustaining human life is fundamentally challenging and that this perspective can be lost or obscured in a world disenfranchised from many aspects of 'labour'. Connectedness with the environment does not necessarily mean harmony; this dependence can be viewed in a positive or a negative light.

Implications for biomass energy

Arendt's analysis may tell us something about how we currently use energy and help us consider the use of biomass. Arendt's central tenet implies that increased use of fossil fuels has served to mask something about the human condition from our collective consciousness: we are less aware of these processes that sustain human lives, as part of a wider life cycle. This work might give us impetus to support the view that it is desirable if we are more aware of our connectedness to and reliance on our surrounding environment, for our own sake, and that biomass could do this, as Thompson suggested. Making the interdependence and necessity visible could mean knowing where biomass comes from and how it was produced, either through local biomass production or sustainability schemes that verify their environmental or social credentials. In addition, without greater transparency a possible danger with biomass production might be that its differences from fossil fuels may not be fully considered, and imports that are difficult to trace could serve to obscure the methods of production.

Biomass can be seen to be part of the cyclical process that Arendt described, whereas fossil fuels are not; fossil fuel is not renewable within an anthropocentric measure of time. If the era of fossil fuel comes to an end in the foreseeable future (Goodstein, 2005), then we return to a situation of relying on 'real time' solar energy, partly produced by the labour of the population, rather than long stored solar energy that must be mined, currently on demand. Adrendt drew on an Aristotlian typology, focused on the representation of the labourer as a reminder of the necessity inherent in the human condition. Within our examination and discussions of energy production and use, biomass can act as a reminder of the great

human, natural and technological effort that goes into sustaining our lives. Thompson states that an idea of 'what it takes to keep a farm going' can provide us with useful metaphors to consider 'what it takes to keep society going.' (Thompson, 2010: 3). A transparent move from fossil fuel use to the use of biomass produced from agriculture (alongside other energy technology options) could provide an insight into the energy metabolism of society and prompt us to reflect more broadly on how we, as individuals and society, use energy. All biomass production, whether food or non-food, incurs a cost in terms of energy inputs, resources and possible environmental impacts. So it is important to note that the use of second generation non-food crops and crop residues will still require land and resources to produce them, hence requiring choices to be made between other human and environmental opportunities (Levidow and Paul, 2008).

Advocating a consideration of energy use must be done while remaining mindful of the great advances brought by technology and increased energy use since the industrial revolution. The majority of the biomass used in the world today is so-called 'traditional' biomass, from wood, animal dung and charcoal for cooking and heating (WBGU, 2008), and more technologically advanced biomass production and use provides for a vastly superior standard of living. Arendt did highlight the potential of technology to bring about positive changes in our condition, but to remain aware of its potential to disenfranchise. This reflection may prompt us to consider how we intend to maintain many of the advances in standard of living globally while making the production of biomass more transparent and considered so it can help us consider our utilisation alongside process for innovative production.

Conclusion

This paper has highlighted some of the ethical issues surrounding the production of biomass for energy on agricultural land. Drawing on the work of Arendt, like agrarian thought, she argues that agriculture has meaning and significance for a society. While agrarianism celebrates the connection between people and the land in agriculture, Arendt views it somewhat negatively, but maintains, similarly to agrarianism that paying attention to our means of sustenance reminds us of something about our own nature and our place in our surroundings. It could be suggested that biomass production gives us an opportunity to do this, particularly in relation to our energy system.

In the way that past food scares and controversies such as BSE in the agricultural sector have brought features of industrial food production into focus and caused us to reflect on them (and incite change), biofuels production and the associated analysis of controversies, could lead to wider reflection on our energy system and the nature of our energy needs. The change from fossil fuel use to biomass represents a change in the value chain leading to reflection on not only the use of biomass resources for energy and how we wish to produce them, but more widely about how we may need to modify and develop the energy system as a whole. In terms of next steps in the analysis of the role of biomass energy, the extent to which different mechanisms such as sustainability schemes or practices of production and use could serve to make connections visible and prompt reflection needs to be explored further.

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Setting the rules of the game: ethical and legal issues raised by bioenergy governance methods

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Abstract

Bioenergy is increasingly promoted as an energy carrier in a time of climate change where there is a pressure to reduce reliance on fossil fuels. Also a strong interest in increased energy security and even self-sufficiency serves as motivating factors for a shift towards more bioenergy use. The supply and demand of bioenergy is to a high degree steered by the market, but is at the same time subject to different types of regulation. Some of this regulation is aimed at securing sustainability of bioenergy solutions. For example the European Union Renewable Energy Directive contains specific sustainability criteria for biofuels for transport if they are to be counting towards actual mitigation impact – whereas for other forms of bioenergy, there has been a reluctance to put similar criteria in place. Thereby regulatory issues become part of an ethical discussion regarding how best to provide bioenergy in the light of a number of potentially conflicting concerns. This paper examines different approaches in bioenergy governance from an ethical and a legal perspective. For this purpose governance is used in the broad sense of steering social systems by state as well as non-state actors, whereas regulation is characterised by state actor initiatives covering a variety of regulatory instruments. In the paper, use of liquid biofuels and solid biofuels (wood pellets), will be used as cases to illustrate the different approaches. For each case, liquid biofuels and wood pellets, the connected legal and ethical challenges are discussed, identifying questions and dilemmas associated with governance approaches. The paper concludes by pointing out some of the main barriers for different methods of regulating bioenergy production and use.

Keywords: biofuels ethical, regulation, sustainability, wood pellets

Bioenergy governance and regulation

Changing from fossil fuels dominance to bioenergy raises a number a technical questions: Is there sufficient biomass, will increased demand lead to prices on fuels surging, what will the level of domestically produced biomass be, how will import be affected? (SRU, 2006) However, biofuel production has itself become one of the major issues in an increasingly fierce debate over climate change and global food security (Mol, 2010). Hence, increasingly the question is how will it be possible to ensure some level of sustainability in bioenergy production and use (cf. Karafyllis, 2003)? Thus building proper regulatory frameworks and promoting new ways of governance are increasingly becoming a matter for discussion in the biofuel sector around the world, cf. Wang (2011) and Bailis and Baka (2011).

How to deal with this discussion depends on the governance approach or type of regulation that is put forward; what kind of incentive structures are put forward (as bioenergy today is more expensive to use than fossil fuels), and what kind of direct or indirect restrictions are imposed (e.g. on import of biomass). Here, following Gunningham (2009), governance is defined in a broad sense as steering social systems by state as well as non-state actors, whereas regulation is characterised by state actor initiatives covering a variety of regulatory instrument. The main drivers of biofuel production – as reflected in EU biofuel policy aims – are energy security, a commitment to economic development, and the mitigation of climate change. More specifically, the Renewable Energy Directive (hereafter 'RED') and the Fuel Quality Directive (hereafter the 'FQD'), which were introduced in 2003 and revised in 2009, reflect

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a number of concerns to be addressed: security of supply through reduced dependency on crude oil and transport fuels; security of agricultural productivity and quality of life in rural areas; and a reduction in GHG emissions through the use of sustainably produced biofuels (Di Lucia and Kronsell, 2010).

The issue of sustainability – which, fair to say, encompasses these concerns – ranges high on the EU agenda as well as nation-wide as biomass to an increasing extent is used. At the moment, only biofuels for transport are subject to the RED sustainability criteria if they are to count towards national renewable energy share obligations. The Directive on renewable energy sets out sustainability criteria for biofuels in its articles 17, 18 and 19. These criteria are related to greenhouse gas savings, land with high biodiversity value, land with high carbon stock and agro-environmental practices. The criteria apply since December 2010. The European Commission has afterwards adopted a number of decisions and Communications to assist the implementation of the EU's sustainability criteria, In February 2010, the Commission recommended that when it comes to solid biofuels (for heat and energy) only guiding principles should be set. Apparently, one reason was that biomass sourced from within the EU (from agriculture and forestry) was considered to be sustainable.

In the remainder of the paper, we will use two paradigmatic cases (as seen in a Danish context) representing two types of bioenergy – solid biomass in the form of wood pellets and liquid biofuels – to see how they relate to two kinds of governance and regulatory approaches – in terms of ensuing ethical concerns. First we present the cases, then set out the regulatory status and challenges of each case, discussing which ethical concerns are directly or indirectly met, and the type of ethical challenges it gives rise to.

Bioenergy developments – two cases

Since the 1990s – and especially since the turn of the century – demand for biomass has increased rapidly, looking at EU as a whole. Approximately 4,000 PJ bioenergy is used per year in the EU, and as the RED states, in 2020 20% of the energy consumption shall be based on renewable energy sources, and 10% of all transport fuels are to be delivered by renewable sources, including biofuels (European Parliament, 2009). In the rest of the world, there is also an increase in demand but not as pronounced as within the EU. Evidently, this is creates a huge demand for biomass and for biomass based fuels. Primarily, within the EU, biomass is used for heating, however in Belgium, the Netherlands and Denmark biomass is to an increasing extent also used in combined heat and power plants (CHP).

Globally, there seems to be agreement that there is sufficient biomass available – acknowledging that the estimates vary considerably – subject to the type of underlying assumptions of especially technical, environmental or economical nature.

Estimates do concur that increase in biomass utilisation within the EU will imply increases in import of biomass from outside Europe, as opposed to the situation today where 95% of solid biomass used, originates from within Europe. Future increased import is likely to come from Russia and Canada, hosting vast forest areas, or from plantations in USA or Brazil – and quite likely in the form of wood pellets which relatively easily can be used as feedstock in coal fired plants.

The case of wood pellets

The market for solid biomass, and especially wood pellets, is rapidly increasing. At present, in Europe, 8 mio. tons of wood pellets are annually consumed, and expected to increase. Different prognoses state that the growth in EU consumption of biomass will increase to 200 mio. tons of dry wood on 2020, of which a significant part is expected to be wood pellets which quite easily can be used in combined

heat and power plants. However, whereas wood pellets from the start mainly have been sourced from local or regional markets they in the future predominantly come from international markets (Junginger *et al*., 2008). In Denmark, in 2001 200,000 tons were imported, 900,000 tons in 2008 – and rising to 1.6 mio. tons imported in 2010, constituting more than 90% of the supply of wood pellets. The main part comes from the Baltics (50%), followed by Germany (17%), Russia (8%) and Canada (6%).

But this type of bioenergy – and the related governance – is not so uncontroversial as it used to be. According to some observers, use of wood pellets does not constitute an example of sustainable bioenergy – because the actual mitigation effect is doubtful. According to the European Energy Agency (EEA), only biomass from sheer waste products (and not from wood from thinnings) can be seen as CO_2 neutral. A crucial point in assessing the sustainability is determining the CO_2 release – over time. Here, some claim that in the first 40 years after getting wood for pellets there will be a higher CO_2 concentration in the atmosphere compared to a situation where coal is burned instead of wood pellets. This has been countered by the argument that only a small amount of CO_2 is being captured in an old forest. If pellets are based on wood which is extracted from forests where the wood would otherwise decay, then it might as well be used for wood pellets. Clearly, the situation is quite complex and illustrates that there is not agreement about the consequences of using wood pellets.

The case of liquid biofuels

The commercially established and most abundant sources of so-called first generation biofuels today are food crops such as soy, palm oil, sugar cane, or corn. Second-generation biofuels are produced from lignocellulosic biomass derived from non-food crops (such as willow or *Miscanthus*) or food crop co-products/'waste' (such as straw); however, further technological and commercial development is still required in order to make these viable.

It is quite an understatement to say that this type of bioenergy for quite a while has been controversial (Buyx and Tait, 2011), especially in relation to the potentially negative effects of land conversion for biofuels in relation to e.g. food security, the role of biofuel production in slowing global warming and deforestation (Gamborg *et al.*, 2012). Change brought about by the annexation of land for crops (in this case, biofuel crops) in these ways is direct land use change (LUC). Indirect change (iLUC) takes place when land that could otherwise be used for food or fodder crops is used to grow biofuel crops. The change is indirect in the sense that it does not necessarily occur where the biofuel feedstock is produced, though of course biofuel production is still the driver of the LUC. The connection between direct LUC and biofuel production is often readily traceable. However, indirect changes are much harder to associate with a specific practice, particularly as many other factors can come into play (Croezen *et al.* 2010). A key area of dispute is whether, and to what extent, indirect LUC should be included in biofuel assessment and be part of sustainability criteria, thus influence how such biofuels should be governed.

Governance approaches in relation to sustainability and ethical challenges

Governing the sustainability of biofuels and other biomass products in a global market is a complicated matter. The main sustainability concern is as indicated above not (only) linked to the product itself but to rather to the land use effects of producing feedstocks for biofuels or other biomass products – including both direct and indirect land use changes. Identifying and accounting for direct – and in particular indirect – land use changes is in itself a highly complex task which makes an appropriate regulation even more difficult.

Governing the sustainability of biofuels and other biomass products consequently raises a number of regulatory challenges relating not only to the complexity of the sustainability issue itself, but also to

the choice of the appropriate regulatory *level* (e.g. international, regional or national) as well as to the choice of the appropriate regulatory *instruments* ranging from more traditional direct regulation to indirect regulation, or perhaps not to use public regulation at all. Furthermore, it illustrates the tendency to develop new forms of governance that cut across different regulatory levels, e.g. transnational regulation, and to use more flexible regulatory instruments (Lin, 2012; Gunningham, 2009; Abbott and Snidal, 2009).

The EU sustainability criteria for biofuels can be characterised as a transnational meta-standard regulation (Lin, 2012). The RED sets up certain sustainability criteria that should be complied with for counting as part of the 10% mandatory share of renewables for transport. Ensuring compliance is, however, not directly controlled by the EU Commission or the Member States, but relies on a number of approved voluntary certification schemes, which – depending on the underlying norms (e.g. environmental norms or norms of sovereignty and market economy, cf. Palmujoki (2009) – might be seen as way to counter negative externalities such as steep increases in food prices (Partzsch, 2011). Thus, the EU sustainability criteria for biofuels is a form of indirect regulation promoting sustainable biofuels without directly prohibiting or restricting biofuels that do not comply with the criteria.

Such types of transnational regulation may in themselves be controversial in the sense that the EU in reality seeks to regulate potential negative effects of biomass production not only within their own jurisdiction but also in other countries which may raise the issue of 'eco-imperialism' (Lin, 2012). Another ethical question concerns how broad the concerns covered should be, as illustrated by the difficulties of accommodating a sustainability concern such as the iLUC.

In addition, international trade law, i.e. WTO law, puts certain constraints on the possibilities of states or state actors, including the EU, to regulate sustainability concerns related to products. It is quite clear that different types of direct regulation, e.g. import prohibitions or restrictions, of different types of biofuels or biomass products based on criteria regarding process and production methods (PPMs) would be problematic in a WTO context. Whether other types of more indirect regulation, e.g. voluntary certification or labelling schemes, are acceptable within the WTO is somewhat more uncertain. Thus, in a WTO context a preferred solution could be not to regulate at all but rather to leave the matter to the private actors and the market.

The EU Commission has been reluctant to adopt similar sustainability criteria for other biomass products. In its 2010 report on sustainability requirements for biomass sources in heating, electricity and cooling (COM(2010)11) the Commission states that the variety of biomass feedstocks makes it difficult to put forward a harmonised scheme at this stage. Rather the Commission recommends that the Member States introduce national sustainability schemes similar to the EU biofuels criteria for larger energy producers (1 MW or more). The Commission also recommends that the greenhouse gas reduction criterion is not applied to wastes. Based on the experiences of national schemes the Commission announced a report on 31 December 2011 assessing whether national schemes have sufficiently and appropriately addressed sustainability concerns. While the development of national schemes may have been somewhat dispersed it appears that the private market actors are establishing sustainability criteria for different biomass products, including wood pellets (the European Pelcert Project and the Global Sustainability Criteria for Wood Pellets (IWPB)).

In effect, it leaves the individual member state or actor in the marketplace to consider the sustainability of solid biofuels and it raises a lot of uncertainty. This is especially the case when it comes to import of biomass from outside EU; biomass which might be based on co-products, or so-called waste or secondary products from types of forestry or other practices which may proceed with a cost of local food insecurity, biodiversity and CO_2 impacts. Hence, the kind of regulatory approach chosen will have an impact in terms of the kind of ethical concerns being taken into account.

Thus, for now it appears that the EU facing these regulatory challenges have adopted two different strategies in relation to biofuels for transport on the one side and other biomass products – such as wood pellets – on the other side, although the latter is still under consideration.

Conclusions

What should be the 'rules of the game' of bioenergy? In what direction could governance move? Do the EU sustainability criteria reflect an appropriate regulatory approach? Would it be possible to refine the sustainability criteria to reflect broader sustainability concerns, including iLUC – and reach political agreement on such criteria? Or would it be more appropriate not to regulate and leave sustainability matters to the market as it seems to have been the case for wood pellets so far? Or are alternative approaches or combinations relevant? These could be so-called flanking policies – i.e. trade policies, such as agreements between EU and non-EU states on subsidies for fallow land or stimulation of growing feedstocks on marginal or degraded land – which more directly may address those sustainability concerns that the EU seems to raise regarding bioenergy products produced outside the EU. These flanking policies, however, have not been settled (European Commission 2010).

When seeking out answers to these questions it is important to note that governance and regulatory issues are part of an *ethical* discussion regarding how best to provide bioenergy in the light of a number of potentially conflicting concerns ranging from GHG mitigation and food security to autonomy and efficiency. Different approaches to governance – from direct regulation to more indirect regulation or even no regulation – thus give rise to different ethical challenges and dilemmas which are not easy, yet pertinent, to address.

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India's agrofuel policies from a feminist-environmentalist perspective

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Abstract

India, facing a growing economy on the one hand and enormous poverty of its population on the other, has developed several policies on biofuels since 2002. The Indian state promotes projects on plants such as Jatropha for biodiesel. In these policies, mitigation of climate change is only one aim of the Indian state. Supply with Indian-made fuel is supposed to enhance economic growth, air pollution should be diminished and poor rural women should be given income opportunities. The national policy for biodiesel from 2008 states that till 2017 20% of the diesel used in India should come from plants, grown and transesterized in India. Enormous efforts from the Indian states and private companies will be necessary. The resources needed for this kind of production – land, water and human work – are limited. NGOs as well as state institutions debate whether the production and use of biofuel can ever be sustainable. The contested policies on biofuel in India are therefore one example of debates on sustainability and the underlying values and ideas about a satisfying livelihood for the Indian people. From a feminist-environmentalist perspective the questions to be asked are not only in which ways men and women are effected differently by, for example, Jatropha plantations. Rather it is important to ask in what ways sustainability is conceptualized and how nature as well as gender features in these concepts. The way we think about material resources such as land, water and human resources, e.g. female reproductive work, show some parallels. Both kinds of resources are seldom thought of as valuable just because they sustain human life, but rather, only if and when they can be monetarized as commodity. In order to figure out ways to provide sustainable livelihoods for everyone, we need to change the way nature and gender are conceptualized in strategies to cope with the ecological crisis. This includes a change of ethics towards a focus on what is necessary for the 'Good Life'. The paper will analyze the concepts of sustainability in Indian biofuel policies from a feminist-environmentalist perspective as well as show an alternative way of thinking about ecology and gender.

Keywords: gender, Jatropha, ecofeminism, biofuel, sustainability

Introduction

Since the 1990's politicians as well as researchers and NGO's have been debating the possibilities to use fuel from plants in order to establish a viable alternative to petrol that is CO_2-neutral. The debates on agrofuel are part of the debates on climate change and strategies to cope with it. It is quite controversial in how far the usage of agrofuel is indeed CO_2-neutral and which kind of agrofuel should be used (Hill *et al*., 2006; Ulgiati, 2001).

Another controversy on agrofuel concerns the social and ecological effects of agrofuel cultivation. Monocultural farming of sugar cane, soybeans and Jatropha often means degradation of soil, expansive use of scarce water resources and a loss of biodiversity. On a social level, NGOs question whether agrofuels can be cultivated without endangering food security. The working conditions on plantations also are a matter of concern, as they often are a health risk and do not provide a sufficient income (Oxfam, 2008; Ponti and Gutierrez, 2009). Despite these controversies many states, among them India,

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view the cultivation of agrofuels as sustainable and economically viable alternative to petroleum (Francis *et al*., 2005).

Ecofeminist perspectives can open up a new way of thinking about these problems, enabling a critique of mainstream economic and ecological thinking and making room for new strategies, taking the importance of gender justice into account. From a feminist-environmentalist perspective the questions to be asked are not only in which ways men and women are effected differently by, for example, Jatropha plantations. Rather it is important to ask in what ways sustainability is conceptualized and how nature as well as gender features in these concepts. Being a rather normative concept, Ecofeminism centers around the question in how far our thoughts on nature are gendered, and how a different perspective on both nature and gender could add to a more just society.

In the following, I will give a brief account of ecofeminist theories and the state of agrofuel policies in Uttarakhand from this perspective. In my conclusion I will give an outlook on the research frame I intend to use during my field work. However, as I will conduct this field work in spring 2012, I will only be able to present my findings during the oral presentation.

An ecofeminist perspective on sustainability

Since the seventies feminist researchers have published works on nature and gender. Significant for this work is its closeness to social movements, especially the women's movement and the ecological movement and its diversity concerning theoretical frames and topics. This makes it quite difficult to give a precise and short overview on Ecofeminism (Hofmeister, 2004: 105). Central for all theories is the question, how nature and gender are related (Merchant, 1987; Ortner, 1972).

The works that can be summarized under the term 'Ecofeminism' consider the relationship of women to nature being closer than is the relationship of men to nature, either because of women's natural ability to give birth or because of the social division of work that constructs them as being closer to nature (Mellor, 1997; Shiva, 1989; Von Werlhof *et al*., 1983).

According to Agarwal (1992), the following are important common assumptions of ecofeminist theories:

- There are parallels between the subjugation of women and the exploitation of nature.
- In patriarchal thought men are constructed as closer to culture, while women are constructed as closer to nature. Nature is viewed as inferior to culture, therefore women are inferior to men.
- Women have a special interest and responsibility to end the exploitation of nature.
- The ecological movement and the women's movement stand for egalitarian, non-hierarchial systems and should cooperate.

Women, being responsible for reproductive work, often are more severely affected by environmental pollution than men. Also, they feel more responsible for their natural environment and are more active in ecological movements. Responsibility for an ecologically viable behavior is handed over to them, resulting in an even higher burden (Schultz, 1993).

Important for my research on agrofuel policies in India are feminist works that center around questions of the gendered division of work. Feminist critiques of economy focus on the construction of female workpower and natural resources as infinite. Both – female reproductive work and natural resources – are devalued or obscured, as only the seemingly productive is valorized as economically relevant. The segregation of productive and reproductive sphere in mainstream economic thought is an artificial one. Reproductive work is not only also productive, but indispensable for the creation and preservation of life. This strand of ecofeminist thought aims at overcoming the separation of productive and

reproductive sphere. It envisions a transformation of the economy towards what is called 'Preemptive Economy' (Vorsorgendes Wirtschaften). In this vision, the economy shall be organized along the principles of forethought, cooperation and orientation towards what is necessary for a Good Life (Biesecker and Hofmeister, 2006, 2010; Biesecker *et al*., 2000; Hofmeister *et al*., 2003; Mölders, 2010).

Starting from this theoretical framework, one will come to the conclusion that mainstream strategies to cope with the global ecological crisis will lead to an exacerbation of the crisis rather than the creation of a sustainable economy that enables a Good Life for everybody. Only if gender as a category of knowledge as well as power is taken into account, a sustainable future is possible.

Taking this theory to an empirical level means to put research questions quite differently. Starting point for this gendered perspective on sustainability are questions on how the separation of productive and reproductive sphere can be avoided. What would policies on agrofuel in India look like if the principles of a preemptive economy – forethought, cooperation and orientation towards what is necessary for a Good Life – were taken into account?

The biofuel policies of the Government of India and Uttarakhand

India enjoys a rapid economic growth, but on the other hand is dependent on crude oil imports and faces severe air pollution (Pelkmans and Papageorgiou, 2005: 8). Since 2002 the Government of India (GoI) has worked on policies on agrofuels, aiming for independence from the world market for crude oil, relief from air pollution and deforestation as well as economic development in the energy sector, opening up income opportunities for the poor rural population, especially women.

Although in some regions, plants such as sugar cane used for ethanol, are preferred, this paper is concerned specifically with the Indian policies on biodiesel. The National Biodiesel Policy of September 2008 states that up to 2017, a quota of 20% agrofuel added to crude oil diesel shall be reached (Altenburg *et al*., 2009: 50). So called Tree-born oil (TBO) is the first choice for most Indian states. The GoI views TBO as preferable because plants such as Jatropha and Pongamia are hardy and are understood to not need a lot of water and can be cultivated on degraded soil. However, so far existing data seems to prove otherwise. It seems that cultivating Jatropha is only economically viable on fertile soil with costly input such as irrigation, pesticides and fertilizer. Considering the long period until the first yield, Jatropha is a high financial risk for small farmers. Additionally, if the seed cannot be sold at a good price, there are no other usages since the seeds are not edible. According to the GoI, only wasteland or degraded forest land should be used for cultivating Jatropha, which in this way shall be made productive. Yet, it is far from certain whether this land actually is unproductive in the first place as it is often used by landless people for gathering fuel and fodder. Even if so-called Below Poverty Line (BPL) families are given land to cultivate Jatropha this means that the usage of land becomes less flexible and poor rural families become dependent on state subsidies and agrocompanies.

Some Indian states, among them Uttarakhand, already work on their own strategies to foster agrofuel plantations. It plans to afforest the degraded land and create income opportunities for BPL families (Lohia, 2006: 255). Uttarakhand, a state with 65% declared forest land bordering on Nepal and Tibet, has formed a public private partnership (PPP) in order to promote the cultivation of Jatropha. At the center of this PPP is the Uttarakhand Biofuel Board (UBB), consisting of two state institutions, the Forest Department and the Forest Management Corporation and a private company, the Uttarakhand Biofuel Ltd. (UBL). The state has chosen 200.000 ha of common land for Jatropha cultivation. This land is declared as wasteland or forest land. It is under administration of van panchayats, local forest councils. These van panchayats exist since 1921 and manage 405.426 ha of forest land in Uttarakhand. The panchayat are not part of the PPP (Altenburg *et al*., 2009: 75).

The UBB has chosen BPL families and provided them with saplings as well as 1-2 ha land. The seeds of the Jatropha plantations – first yields are to be expected in 2012 at the earliest – will be bought from the BPL families by the state institutions at a price of 3 rs/kg and re-sold to the UBL. The UBL will create the infrastructure needed for transesterification of Jatropha oil to biodiesel (Altenburg *et al*., 2009: 84; Lohia, 2006: 257).

Although the state included the panchayats in the process of choosing land and identifiying BPL families for cultivation it is not clear in how far this process has been participative and democratic. Also, it is not clear whether the land now used for Jatropha cultivation indeed was 'unproductive'. Uttarakhand has a long history of commonly used land, and this resource is especially important for the rural population. There is a high risk that small farmers and landless people have been deprived of an important source of fodder for their livestock and fuel without a sustainable alternative. Also, an economic structure that contributed to a sustainable economy may have been impaired.

Conclusion

The aims of the GoI and the state of Uttarakhand are clearly situated within a mainstream economic frame. The goal to create a market for agrofuel in India may be not be reached within the next decade, but the motivation is quite visible. Independence from the world market for crude oil and income opportunities for the rural population are part of a thinking that focuses on a mainstream understanding of productivity and profit. Ecological and social goals are named, but are only add-ons to a strategy that promotes the needs of agrocompanies rather than the needs and realities of the subjects of the agrofuel policies. This leads to the observation that:

- Cultivating Jatropha is a high economic risk for small farmers, as a lot of capital is needed until profit can be expected. Also, they become less flexible and more dependent on companies (FIAN, 2008: 7).
- Cultivating non-edible and one-use-only plants also is risky for farmers, as they are dependent on market prices they cannot influence.
- The state of Uttarakhand acts as a broker between BPL-families and a private company, thus fostering their dependence.
- The economic structure of the common lands of Uttarakhand is inevitably altered, towards a large-scale cultivation of a single plant only profitable in a market context.
- Formerly common land is withdrawn from the former users and turned into private land.
- Food security is thought about only in terms of ‚productive' land use, questions of biodiversity and traditional knowledge remain unanswered.
- Resources such as land and (female) (re)productive labor of the rural poor feature as free of cost and so far unproductive.
- Poor families and especially women are constructed as unproductive and cheap laborers.

To sum up, these policies on agrofuel in India are part of the debates on climate change and coping strategies as well as part of the debates on how a sustainable future in the face of severe ecological crisis can be fostered. State institutions such as the GoI, the National Planning Commission and civil society institutions on the other hand generate knowledge on sustainability in the field of agrofuels in India. At the center of these debates is the question, how a good life for everybody is possible now and in the future (FIAN, 2008; Government of India, 2008; Ramani and Joshi, 2009; Rossi and Lambrou, 2009; World Bank, 2008).

Looking at these debates from an ecofeminist perspective shows that ecological and social questions only feature as add-ons to the goal of economic profit for private companies. The needs and wishes of the ones concerned by these policies are not acknowledged. Starting from the theoretical framework of a preemptive economy, one has to ask what economic structures are already in place in Uttarakhand in

the field of forest management. The van panchayat, so far managing the forest land, have a good chance of working with the principles promoted by preemptive economy. They are based on forethought and cooperation – although a Good Life yet has to be established for a majority of the Uttarakhand population. However, destroying these structures will not lead to a sustainable economy or a Good Life for everybody, but rather jeopardize the chances to build a sustainable economy. However, so far empirical data is missing to prove the hypothesis' of this paper. Questions to be answered during my field trip in spring are:

- What is the state of Jatropha plantations in Uttarakhand?
- What economic and social structures are in place concerning the forest management of the van panchayat?
- What assumptions on sustainability and gender have the members of the UBB and the van panchayat?
- What gendered divisions of work are in place concerning the Jatropha plantations?

Based on this empirical data it will be a further task of my research to come to synthesis of my theoretical framework and my findings and to derive from that what a preemptive forest economy in Uttarakhand would look like.

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Grafting our biobased economies on African roots?

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Abstract

Sustainable development has become defined as a core demand for innovation over the past decade. With the ensuing step from a fossil-fuel-based to a bio-based economy, the need for biomass production for biofuels and biomaterials has increased dramatically. Although the United States has enough land surface available for domestic production, it is not likely that the necessary biomass to 'fuel' Europe can be grown domestically, and therefore, Europe plans several investment initiatives in non-domestic agriculture, including locations in Africa. China, as one of the most important growing economies in the world is also increasingly investing in African agriculture. In Africa, a large percentage of arable land is currently not in use for agriculture. Additionally, the production potential of developing countries near the equator is significantly higher than the production potential of countries in more temperate climates such as most of Europe. The production of biomass for biorenewables has come under increasing criticism due to its supposed threat to the production of food in Africa. Thus, the consequences for developing countries and the delicate natural balance of protected ecosystems are debated. Here we question how differences in Chinese and European worldview and the way these inform the respective value systems affect the current development towards an Africa-based growth of biomass for biofuels and -materials.

Keywords: biorenewables, land use, technology optimism, shift of use, developing countries, China.

Introduction

At present, we are faced with global challenges with regard to our growing need for energy and products, due to the combination of global population growth and global welfare growth. These challenges have become more important through the depletion of oil and gas and the growing concern for climate change and the impact of greenhouse gases. Hence, the production processes for fuel and plastics from fossilised sources (oil, coal and gas) have become a less viable option. These traditional approaches, whilst still dominant, are seen to be in need of complementary production processes and in the long run even replacement-strategies given their unsustainable nature. More efficient modification methods would be one strategy, but more importantly, one of the strategies to meet these challenges is to produce fuel and materials from biomass derived from crops. It has the advantage that crops can be grown infinitely, and that the CO_2 that is produced by the use of the resulting biomass was taken out of the atmosphere by the crops during their cultivation. The CO_2 that is produced by the use of fossilised fuels was taken out of the atmosphere millions of years ago. The current use of fossilised fuels frees this 'locked' CO_2, therefore transforming our atmosphere to a state that is threatening for certain aspects of human civilisation as well as the environment.

The societal debate on biofuels and other bio-renewables has lost much of its necessary nuance due to the polarisation that followed the criticism of their purported effect on food production. It appears that for many, it is easier to ignore the persistent complexity of the development and introduction of bio-renewables than to accommodate for it. In societal debate, scientists, industry and policy makers often entrench themselves in their own paradigms and viewpoints, minimising or even ignoring secondary problems of shifts in land use, multi-applicability of technology and democratic transparency.

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In this paper, we aim to articulate the worldviews and underlying value frames of different stakeholders in the development of bio-renewables in discussing the hurdles that stand in the way of a better argued motivation for the shift to a bio-based economy. This way, we hope to provide further insight into the global aspects of this persistent complexity. We will mainly focus on the respective treatments of the relation between the concepts of individual and community in European and Chinese worldviews.

We will look at Chinese worldviews, regarding these to be based in philosophical/religious traditions of Confucianism, Taoism, Buddhism (Jenkins, 2002), but also how these fit in with Marxism-Leninism. We will regard European worldviews mainly through the lens of its prioritisation of the individual, specifically as constructed in neo-liberalism (Landeweerd, 2009). Since this paper in the first place treats the distinction between Europe and China in their respective initiatives in African agriculture, and its consequences for African agriculture. We will not take African worldviews into account, although we do want to acknowledge their importance in the broader sense of a successful introduction of novel production methods and novel forms of land use in Africa. Our aim here however is more modest: we will only elucidate some distinctions between Chinese and European worldviews with regard to both their intentions of using African land for growing biomass, and how a comparison between the two can demonstrate the respective moral benefits and harms.

A first and generally well-known distinction between the Chinese and the European worldviews concerns the relationship between individual and community. In this relationship, Europe gives precedence to the individual and has done so since at least the age of Enlightenment, and even more so since the advent of liberalism (Landeweerd, 2009). In China the situation is reversed. The community is usually given precedence over the individual, and this is not merely a consequence of the current political ideology of Marxism-Leninism, before communism; it had already been articulated in Confucian thought (Jenkins, 2002). These respective attitudes to the relationship individual-community frame two different problem areas: for China, the issue seems to be whether one can limit the circle of solidarity, for Europe, to what extent personal enjoyment of energy benefits is to have precedence over global concerns. This means that there is both a conflict of rights, and a conflict of interests involved, and in both cases, it concerns the autonomy of local communities and of the different nations involved.

An investigation of background values and worldviews may help in conducting an informed moral analysis of the political and societal consequences of both Europe and China's increasing investment in African agriculture. The different cultural traditions however should not be taken as representative for all value systems in the regions involved. We believe this approach of using comparative/intercultural philosophy to clarify issues of communication and mutual understanding in current bilateral debates on sustainable energy use would lead to a better disciplinary cross pollination between worldviews and therefore to a better governance of available arable land in Africa. An involvement of African communities in such governance is a complementary step that is necessary for a good governance of this issue. Such involvement would benefit from such a preceding exchange. This latter step however remains outside of the scope of this paper.

Global issues in land use

One problem of the production of biomass for biofuels by growing crops is that Europe does not have sufficient land available for growing both crops for food, feed, energy (including fuel) and materials (Food and Agricultural Organisation, 2006). Furthermore, the moderate climates have much less production potential than the tropical zone, around the equator. Indeed, to grow more in Europe it would be necessary to add fertiliser to the soil which would almost certainly have to come from fossil based sources, defeating the purpose. China, currently one of two growing superpowers (the other being India), will in the near future increasingly contribute to the greenhouse effect and due to its coal-based

industry is allegedly one of the most polluting nations in the world. China is one of the two most severely polluting nation in the world, the other being the United States. The impact of the increasing energy demands in China on climate change affects the whole world. In the 2012 second report on climate change to the national assembly, commissioned by the Chinese government, there is a prediction that by 2050, approximately 25% of the population will have serious problems with the availability of water. Therefore, China has reason to take initiatives for the development of a more bio-based economy. There are additional advantages in growing biomass and processing it in developing countries, since it may aid the economies involved and may increase domestic welfare standards as well as those in developing countries (Lynd and Cruz, 2011).

Both Europe and China seek to invest in African agriculture. A major societal concern is that such non-African ventures in Africa may increase the existing issue related to food scarcity, hunger and connected health issues for local communities (Serageldin and Persley, 2005). In view of the economic opportunities for more powerful parties to cooperate in the production of biomass for non-African purposes, this might increase food and feed shortage for communities that are already vulnerable in this respect. African experts recognise that such social, cultural, political and societal problems necessitate a specific approach to the production of biofuels (African Convention of the Global Sustainable Bioenergy Project, 2010). There is a technological and societal potential to turn this possible disadvantage into an advantage. One could provide local communities with the technologies and know-how to intensify their agriculture and one could increase food imports from other parts of Africa. This leaves open many issues such as corruption of local and national governments, and the way in which the global operationalisation of patent law potentially bars transfer of know how and technology to other parts of the world. It has been argued that the patent system attracts speculators who prefer to acquire and enforce patents rather than engage in research, development, manufacturing, or other socially productive activity (Schacht and Thomas, 2005).

In their investment in African agriculture, initiatives from Europe and China push for dramatic changes in local African infrastructures. This is sometimes perceived as a disadvantage but it would actually contribute to solving a major issue in food security: the problem of food transportation. With these developments, the concern still is to what effect China and Europe are also investing in a sustainable development and to what extent they are able and willing to avoid displacement of populations, effects on food production, and damage to both natural ecosystems and traditional agricultural practices. To be able to avoid such effects and to be able to have African nations and local communities benefit from this as a societal and economic incentive, certain basic and often implicit hurdles in the communication between China and Europe on sustainable energy need to be negotiated. A translation of the existing comparative and intercultural philosophy between China and Europe to the debate on biomass production in Africa may contribute to such a negotiation.

Value negotiations

The underlying values of both Europe and China paradigmatically shape internal discourses, creating issues of incommensurability due to difficulties to translate from one vocabulary into the other. Values are operated to provide further understanding and hence solutions to different opinions or practices. In spite of internal pluralisms, one can perceive of several fundamental distinctions between Chinese and European worldviews. This should not merely be treated as a socio-cultural phenomenon, but in the distinct philosophical articulation thereof. For the west there is a strong focus on the relationship between individual and state (Habermas, 2003) from at least the 18th century onwards, whilst in China the focus has traditionally on the community, both in Confucianism/Taoism and in Marxism-Leninism. This is also valid for the concept of individual autonomy (Hall and Ames, 2003). The Chinese worldview tends to focus not on the individual but on the community, and as such, Chinese

culture approaches issues from a perspective beyond one generation (Van der Leeuw, 2003). This moral priority becomes the more important in the light of sustainability. By contrast, the European worldview is said to place the individual first. As it is not based in a concept of the community – which stretches out into the future – it therefore often focuses on a shorter term.

China and Europe have very distinct implicit frameworks of perception of sustainability, energy production and use, welfare, nature, biotechnology, etc.. This puts up obstacles in the dialogue between Europe and China on the mutual establishment of a bio-based economy according to the proper socio-cultural sustainability criteria: The Declaration of Human Rights might be problematic in its possible occidocentric nature. It is criticised for an implicit 'framing'. Article 27 Universal Declaration of Human Rights states:

> (1) Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits. (2) Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.

This article is very much framed within neo-liberalist terms, specifically with regard to its prioritisation of the right to self-expression of the individual. The ideals of the 18th century and the emergence of liberalism gave a priority to personal autonomy. As a result, western thought has increasingly focused on the individual; individual autonomy has become the keystone of western ethics and morality. Public morality in Western societies has been strongly influenced by the principles of liberalism. Individual autonomy is taken as a basis for the organisation of society. The place of the state is filled in negatively: a 'do not intervene unless individual freedom is at stake' rather than an 'intervene to shape society and its individuals' in a proactive fashion (Landeweerd, 2009). With this current focus on individual autonomy, the developed countries are becoming increasingly inept to deal with current problems of energy depletion, and control of resources.

Liberalism tries to protect the individual from unwarranted State intervention, but in taking the individual to be central to societal organisation, it has a tendency to be blind to the rights and needs of the community. Furthermore, in perceiving of the State as the central seat of power in society, it ignores the power structures that evolved over the second half of the twentieth century, that are not limited to the borders of one nation alone: the United Nations, the World Trade Organisation, the European Union, multinational companies, financial transactions, etc. The current problem of energy depletion and issues of climate control necessitate a different approach in which this shift of balance from national governments to organisations such as the United Nations, the World Trade Organisation, the European Union, multinational companies, is taken into account in its effect on community rights. Although the issues that are at play are similar, there is an enormous contrast with Europe that, since China for ages took Confucianism, and later Marxism-Leninism as the central thread and guiding instrument for politics, society and thus governance of science and technology.

There is already a longstanding mutual reception between Chinese and European thought: in Europe since the 18th century, when Leibniz came across amongst others the I Ching, (the divination-hexagrammes which actually appear to have inspired him to define the binary system), with regard to China since the 19th century (for example through Kang Youwei (Zarrow, 2005)). More recently the Confucian and Taoist (Chi: existence is change) Chinese traditions have gained more attention in a move to a philosophical reorientation from Marxist-Leninist philosophy (which knows a specific embedding in the pre-existing Chinese tradition). These distinct traditions have for some time been in dialogue. This is less the case for the non-philosophical world. Specifically in the dialogue on global sustainability standards, the bilateral debate has been governed by mutual misunderstandings. These cannot merely be traced back to differences in language and tradition; they are the result of fundamentally different

conceptualisations. Politics, technology, economy and law are all areas that lend themselves less to an exchange since putting one's own presuppositions up for debate is not central to these areas.

In different cultures, priorities with regard to social and environmental standards are also perceived differently. The Chinese worldview may hold an advantage over current utilitarian and neo-liberalist rationales for action. As Jenkins defends, the Chinese worldview goes well beyond a simple utilitarian belief that only micro-economic incentives can lead to collective action, since it frames the individual in its social-psychological role in the collective (Jenkins, 2002). The criteria for sustainable biofuels that are being set up by different organisations and governmental bodies are now incorporating socio-cultural standards as well as greenhouse gas reduction standards (Oxfam briefing note, 2007). The incorporation of such socio-cultural standards seems to increase the lack of clarity of the field and frustrate any attempt to create action perspectives that can guide scientific and political choice (Landeweerd *et al*., 2011). An approach of a global nature cannot be defined from one dominant perspective alone and initiatives that push one agenda, or are defined from one background are bound to meet with failure. It needs to take into account the complexity of the processes involved rather than reducing these to simple causal linear explanations (Landeweerd *et al*., 2011). The transition to a bio-based economy needs to be assessed in its nature as a process, rather than being assessed on a product-basis. The difference between Chinese and Western worldviews can also be perceived in their view of nature. The Chinese hold a 'relationist' and 'structuralist' view on nature, whilst Europe remains substantivist, in that it conceives of the world in terms of things rather than processes (Landeweerd, 2009), and holds a predominantly mechanical view on nature (Ronan, 1978). However, both in the natural and the social sciences, there has been an increasing tendency in the west to turn to process thought. This (collection of) approach(es) may well prove to be much more equipped to deal with the issues in the move to a bio-based economy.

Discussion

China and Europe's current shift to biobased products is going to influence land use in other parts of the world. It may have a negative as well as positive effect for local populations in those other parts of the world. Although many fruits of science and technology are aimed at benefitting humanity as a whole, this will only work for Africa if technological challenges as well as societal challenges are met in mutual cooperation. Part of this may be achieved by opening up the dialogue through a comparative and intercultural philosophical investigation into the Chinese and European political, social and economical aspects of such investments in African agriculture. An essential step would of course be the involvement of Africa in such processes.

Democracy in the West may have made the nation state into a lame duck in setting goals for a sustainable bio-based economy. The Chinese state appears to have an advantage over traditional Western nation-States in this respect. In spite of perceived and real injustices for individual persons that are the consequence of its authoritative societal structure, Chinese society has greater versatility in order to deal with large-scale problems such as climate change, and innovation of energy sources. Western societies are incapable of influencing issues of sustainability through politics, given their focus on the state-individual relationship. International treatises on CO_2, are however seen to be problematic: the 2010 Kyoto protocol, in which emerging economies are not yet obliged to follow its demands has been a particular target of such criticism. The initiative to invest in African land should never lead to a neo-colonialist abuse of an already vulnerable continent: it should reinforce and build upon emancipation of those involved, furthering their interests and goals in the process. In this respect, China and Europe may well learn from an exchange of worldviews rather than be separated by such fundamental differences.

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Section 9. Food policy

Transformation of food governance models: perspectives arisen from a food citizenship

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Abstract

Prominent amongst the factors which in recent decades have brought about profound changes in our food systems is the deregulation of food markets. This, in turn, exists within a context of the growing integration of economies and societies at a world level. Often cited in defence of globalisation is its positive impact upon productivity and global economic growth, but we cannot continue to ignore its negative effects. In the hope of transcending the negative aspects of this transformation and consolidating all that has been achieved in a positive sense, the context of this investigation is the way in which we should focus the future governance of food in the European Union; particularly, how to direct the participation of public authorities in the food fact. It has already been said that current food systems lack the necessary tools of governance with which to confront the challenges posed by nutritional health, sustainability, the economic development of populations or the protection of the cultural wealth associated with the food fact. What are its shortcomings? In which way should we transform them? This work analyses some of the proposals for modification of governance presently under consideration. Thus, amongst them, those which seek to guarantee food security, the right to a self-determined food system, and the emerging idea of a food citizenship.

Keywords: food constitutionalism, food citizen, food related fundamental rights, food governance

New models of reflection upon the food fact and its governance, considerations regarding the emerging *food constitutionalism*

The decisions that we take individually and collectively with regard to the production, distribution and consumption of food are today the object of a model of critical reflection which is unprecedented in the history of food ethics. We reflect upon food systems – be it upon their global nature, be it upon particular aspects – focusing upon parameters such as their environmental sustainability or their fairness from a socioeconomic point of view; we also examine food's relationship not only with health in a broader sense, but also with other values such as cultural diversity or the development of personal identity (Mair, 2005). Apart from the topics that it addresses, this model of reflection is characterised by the presence of other elements. I refer, in particular, to the belief, more or less explicit, that societies are in some way capable of generating rational changes in food systems. In other words, a certain presumption that these systems could be oriented so they achieve goals that go far beyond that of satisfying the basic need to feed oneself. This belief also has another side, which is the perception that there currently exists *a governance* of the food fact; a reference model of the food fact that we do not control, but which we could come to direct, and thus, reorient or transform. Protagonists of this potential revolution include not only public authorities at different levels or various types of institutions, but also the consumer, an *empowered* consumer. Consumers whom in a Utopian model of governance we elevate to the category of *food citizens* and who exercise their portion of sovereignty by adding their little decisions to those taken by hundreds of thousands of other food citizens. Characteristic of this approach, despite the diversity of ideas, attitudes and tools proposed, is also the ultimate wish for the food fact to be fairer, sustainable and worthy of the human being.

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There are many scientific perspectives from which one can analyse this model of reflection, both as a whole and within some of the issues under debate. This research addresses it from a perspective that might be described as *food constitutionalism*. That is, by seeking how, in that desire to change the model of governance, a series of instruments are being projected upon the food fact which, for centuries, we have been employing to control power and acknowledge in those governed a *status digno* before those who govern. The first historical manifestations of constitutionalism, as we know, were projected in the late 18th and early 19th centuries upon *the State*. But since the aftermath of the Second World War the goal of constitutionalism in Western Europe has been the transformation applied to *society as a whole* (De Cabo Martin, 2006). This is a projection of State intervention upon all aspects of social life, the aim of which is the effective fulfillment of those principles and values that were agreed upon in the Constitution as the basis of co-existence.

As we know, globalisation is blurring States and centres of political power in general, but in spite of institutional weakness, we maintain ideas and attitudes, patterns of behaviour before authority which conserve the essence of nineteenth-century constitutionalism. What stands out is the deeply rooted right of the governed to consent to governance and to modify it when it does not offer sufficient guarantee of their fundamental rights and liberties (see already the Declaration of Independence, USA). Amongst others, we find traces of a new kind of constitutionalism – referred to by some as multilevel constitutionalism (Balaguer, 2005) – in some of the proposals that seek to consolidate food security via the recognition of a human right to food; also in those proposals of defence of food sovereignty expressed as the right to a self-determined food system and, lastly, in the conceptions of food citizenship which seek a projection onto the food fact of the fundamental rights and liberties of citizens. Let us examine these in greater detail.

Can a right in the strict sense of the word be born of access to 'sufficient and adequate' food?

The consolidation of the objective of food security in the international arena is regarded as an evolution of article 25 of the Universal Declaration on Human Rights of 1948 (henceforth, UDHR); this, as we know, declares that 'everyone has the right to a standard of living adequate for the health and well-being', and *food* appears as one of the elements of this standard of living. This right to an adequate standard of living was developed in the International *Covenant on Economic, Social and Cultural Rights* (ICESCR, 1966) and has been the starting point for over 200 definitions, each with its nuances, regarding the meaning of food security (Page and Redcliff, 2002). Of particular note in this formulation is the fact that food has not been located –or only to a lesser degree- in such a way as to render more evident its close connection with the guarantee of the right to life. There have been very few exceptions to this discourse. Thus, the Commission on Human Rights´ (UN) Report on the Right to food, stated in 2001 that 'To die of hunger is equivalent to being murdered' and that chronic and serious undernourishment *is a violation of the fundamental right to life* (art. 3. UDHR); but this has not prompted the creation of a body of law in line with this affirmation; at least not to its final conclusion. This should come as no surprise, because European legal systems –and consequently the *European Court on Human Rights* (see *Soering* case, 1989) – have understood that the right to life only allows for the request for protection *upon serious and imminent threat* to the person´s life. The insistence upon this imminence has been the argument used to reject the claim that the right to life justifies the demand for certain minimum living conditions (or protection against hunger, art.11.2 ICESCR), interpreting these conditions as pertaining to social and economic rights.

The development of food security and the implications of the right to food quickly distanced themselves from the right to life, and another route has been taken in the quest for their consolidation. The Rome World Food Summit (1996) delved deeper into food security, deciding that this exists 'when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their

dietary needs and food preferences for an active and healthy life'. In the opinion of Mechelm (2004), along with principles such as transparency or the desire to take into account or empower consumers, *present* in this broad concept of food security are human dignity and the acknowledgement of the most essential rights. But does this *presence* allow for the claim for the right to food in the strictest sense? Are we speaking of a right associated with the responsibility of someone who ought to guarantee it, or is it, on the contrary, merely a principle, an objective? The current institutional structure, both within States and at supranational and international level, is still some way away from the establishment of a right *stricto sensu*. Meanwhile, 'every day hunger perpetrates a silent genocide' (Ziegler, 2001).

The demands for food sovereignty and the right to a self-determined food system, from a legal-constitutional perspective

More than a tendency towards governance, recent decades have been characterised by a tendency towards 'disgovernance' of the food system. Historically, given the social and economic importance of food, it has been the object of regulation ot intervention more often than other consumer goods, something which according to experts has been due not only to reasons of public health, but also to the fact that comparatively speaking food was more closely attached than other products to the traditions and legal and cultural conceptions of each country. This explains why its economic integration in the European Union required a special effort and resulted in a system in which in order to reduce litigation *minimum* harmonisation was set at a very high level (Escajedo, 2009).

A market integrated in these terms tends to homogenise into one the nearly 500 million consumers whom it serves. In these circumstances, there is a demand for spaces that recognise, or at least respect, the relationship between food and personal identity and the free development of the latter. These kinds of demands by civil society have a certain connection with demands for food sovereignty of the type formulated by Via Campesina, albeit with nuances. The control of a food system continues to be an instrument of domination and, consequently, defence against interference often adopts a profile of demand for sovereignty or the right to self-determination. In a parallel forum to the *World Food Summit* in Rome (1996) *Via Campesina* described food sovereignty as the 'right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems'; that right of peoples would represent an alternative to the model configured by the WTO, seeking to separate food from free trade or at least temper some of the effects of the latter. Criteria such as the control of territory, the local market, biodiversity, autonomy, health or culture are the keys of this proposal of governance of the food fact; a governance that clearly wishes for food no longer to be considered as mere consumer goods. In the case of the European Union the collectives which demand the self-determination of the food system would not identify with the concept of 'people', but are rather individuals connected by personal convictions, ideological options, and who wish to exercise their food choices in coherence with their personal identity.

What are the chances of success of a right to determine the actual food system within the Union? The single market has at its disposal measures which protect the integration and the setting up of alternative food systems, unless they were based exclusively upon decisions taken by the consumers themselves, could clash with the prohibition of articles 34 and 35 of the *Treaty on the Functioning of the European Union* (TFEU), regarding the *quantitative restrictions on imports* and *exports,* and all measures having equivalent effect between Member States. Although art. 36 leaves margin to consider some prohibitions or restrictions 'justified on grounds of public morality, public policy or public security; the protection of health and life of humans, animals or plants; the protection of national treasures possessing artistic, historic or archaeological value; or the protection of industrial and commercial property', such restrictions cannot constitute 'means of arbitrary discrimination or a disguised restriction on trade between Member States'.

Are there any other prospects? Access to food has historically been critical in the development of human communities and today the food fact is the stage for fierce *competition* over the use of water, land or energy. There is no single centre of governance which can mediate in order that this *competition* might be fairer. Some authors think that, in general, radical opposition to economic globalisation is somewhat irrational and are unenthusiastic about the possibility of finding alternatives, even in the case of food; there are however other voices who see the possibility of some progress. Revolutions always begin somewhere. We coincide in our belief that a new world food order – or perhaps more correctly a world food *order* – is a Utopia in the short- or mid-term; as also appears to be the establishment of a model of *constitutional* governance of globalisation, in the sense of being subject to political-legal controls guaranteeing the rights of individuals and collectives, minorities included. We lack the materials with which to build it; the process of globalisation has had a considerable impact upon the sovereignty of States and there are de facto powers stronger than States themselves (Balaguer, 2005). The bodies responsible for some aspects of governance of the food factor are fragmented and separate from institutions in which decisions are taken on a 'one member, one vote' basis; this fragmentation, say the experts, has been strategically engineered in order that certain countries might maintain their predominance in the formulation of food and agricultural policies (Brem-Wilson, 2009). A *constitutional convention,* which would establish a more solid model of governance and allow for mediation between countries to arrive at fairer solutions, seems today to be very distant. More tangible appear, therefore, those initiatives seeking short- and mid-term alternatives, such as the use of different types of market constraints. The empowerment of consumers, in order for them to exercise their food options taking into account ends beyond those most immediate, is –as we shall see- a scenario that offers a multitude of opportunities.

The food citizen as ground for the rebuilding of the food governance

Within the notion of re-establishment of governance of the food fact by empowering the consumer one perceives a very interesting blend of, on the one hand, broader demands by civil society and, on the other, ethical proposals emerging as a as a development of the idea of responsible consumption applied to food. As opposed to an unthinking model of accelerated consumption, which seeks to reduce 7 billion people to one single *consumer* food citizenship appears as an invitation to project the values of individuals into the various decisions regarding consumption. Depending on what is by cumulative effect projected by consumers, it is clear that the accumulation of individual decisions can have a significant impact upon the free market. Apart from its undeniable value as an instrument of social pedagogy, this concept of food citizenship has the potential to sustain *critical spaces* with regard to governance of the food fact and look for alternatives to the present model. Thus, Wright and Middendorf (2008) refers to the possibility of citizens 'appropriating' and restructuring their food systems, and De Tavernier (personal communication) infers that in the future food policies will redefine *food consumption*, considering it to be an expression of citizenship.

The transition from food consumer to food citizen suggests an acknowledgement of the latter as an individual with capacity to exercise his or her fundamental rights in the food fact. Situated within the evolution of the protection of food consumers in the EU, it represents embarking on a new phase in the Union. As we know, until 1975 no measures were organised in favor of European consumers as a whole. Since then there has a debate as to whether the definitive orientation of consumer policies should be paternalist – assuming the consumer always to be a weak party- or, on the contrary, a policy which integrates consumer protection within the *correct functioning of the market*. According to the latter approach, the consumer *could only* aspire to act freely in the market, as just another actor, following the necessary adjustments in respect. In practical terms many of the actions of empowerment of the consumer have eventually taken the form of decisions with regard to labelling; offering information allowing for autonomy in directing one's consumption in keeping with criteria deemed to be appropriate. The outcome so far has its good and its bad points, which will be analysed in the final section.

Pros and cons of the paths to food citizenship in the EU

Current labelling does not reflect the complexity of motivations which the proposals for responsible consumption invite us to take into account when we make decisions regarding food, although herein lie the hopes for development of food citizenship. If we focus upon the specific regulation of some food groups, we see that the concept of average consumer employed as a reference for the information to be provided, is a zigzagging concept. Sometimes consumers are 'normally informed, reasonably attentive and aware'; on other occasions they are consumers at risk of obesity because they are not able to choose *healthy* food (Regulation EC 1924/2006 on health claims made on food); we also come across consumers who – although quality and food safety are guaranteed – may have ethical sensibilities with regard to certain forms of food production (Regulation EC 1829/2003 on genetically modified products), and finally, there is room for a demanding consumer whose trust is persistently sought (e.g. Regulation EC 834/2007 on ecological products). This absence of univocity in the concept of consumer no does little to help.

Amongst other challenges presented in this task of empowering the consumer is the concern with how to guarantee an appropriate use of labels that do not strictly refer to the product or to its safety; for instance, extrinsic considerations such as those related to sustainability, *labour conditions* or fair trade. Not only are extrinsic claims voluntary, they also depend on criteria that are not entirely *objective*. Is it possible to establish a common barometer, traceability systems? Otherwise, there exists a risk of manipulation and abuse of labelling. Meanwhile, a second challenge is the question of how to ensure that producers or distributors include on the label information that does not refer intrinsically to the product. Given the cost of labelling and the fact that consumer protection is generally understood in an integrated manner, in other words, as harmonized with other equally legitimate interests of other actors operating in the market, a mandatory system of labelling seems unlikely. And, in fact, nowadays, many labels form a part of market strategies, of the search for niches within the consumer group as a whole.

Finally, we come to the challenge of not forgetting that these strategies were considered in the context of a wider Utopia, of a desire for a food governance more in keeping with values that transcend mere satisfaction of the basic need to feed oneself. Reference has been made to the fact that present tools for the exercise of food citizenship do not break the prevailing model of '(dis)governance' in a violent fashion, but seek to establish a path in the short- and mid-term. In the long term, however, it should not be forgotten that they also call for an imaginative reconquest of the public space (García-Canclini, 1995). For we cannot leave to chance all the collective value of the direction with which thousands of food citizens decide to invest their decisions. Fairness/equity, sustainability, socio-economic development, the protection of cultural diversity and, above all, the guarantee of a decent life for all human beings cannot be achieved without joint and continued effort, which will require, in many cases, a renouncement of individual in favour of collective interest.

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Food policy and climate change: uncovering the missing links

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Abstract

The paper investigates the causes of the lack of interest of food policy towards the issue of climate change. In the first section, food policy is scrutinized stemming from some recent contributions of the two related strains of literature on food regime and on private food governance. It is shown that over the last twenty years food policy has been dictated more by neoliberal ideology and corporate power than by ethical concerns over human societies and environmental well-being. The second section analyzes the main obstacles which hinder the implementation of food policies able to contrast climate change. The main conclusion of the paper is that in order to have a climate-friendly food policy it is necessary not only to oppose the economic and political power of corporations but also to challenge neoliberalism on theoretical ground.

Keywords: food policy, utilitarianism, neoliberalism

Introduction

The global food system is accountable for nearly 50% (Grain, 2009) of total world greenhouse gas emissions (GHG). Besides being a major contributor to climate change, food is also one of the sectors most affected by climate change. Notwithstanding its close relationship with climate change, in terms both of causes and consequences, the food system has not so far been a main target of mitigation and adaptation policies. Food policy in particular has not yet directly addressed the way in which climate change may put future food safety and security at risk. The paper investigates the causes of this lack of interest of food policy towards the issue of climate change. In the first section, food policy is put under scrutiny with reference to some recent contributions from the two related strains of literature on food regime and on private food governance. It is shown that, over the last twenty years, food policy has been dictated more by neoliberal ideology and corporate power than by ethical concerns for human societies and environmental well-being. The second section analyzes the main obstacles which hinder the implementation of food policies able to contrast climate change. Beyond the large power asymmetries in food governance, which cause private interests to prevail over public good, the main obstacle is posed by the supremacy of preference utilitarianism as the moral theory underpinning economics. As long as utilitarianism prevails over more deontology-oriented theories, public intervention needed to contrast climate change will find scant political legitimization.

Food policy and climate change: the current neoliberal agenda

With respect to the food sector, the issue of climate change is consistent with the three main goals of public intervention: correction of market failures, distributive justice, and upholding of human rights. The specific market failures associated with the problem of climate change are the negative externalities produced by GHG emissions and the fact that mitigation intervention takes the form of a public good (mitigation intervention can be considered a public good because it exhibits both the property of non excludability and non rivalry). Problems of distributive justice (Kverndlock and Rose, 2008; Maltais, 2008) are related to the well known case of intergenerational distributive equity, due to the fact that future generations will suffer the most from the current GHG emissions and to the less investigated case of inter-countries distributional effects. Human rights concerns depend on the fact that, beyond being a

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public good, the protection of a stable climate that fits human biological and economic needs (among which food) can be considered to be a human right. In particular, it is of the kind of second generation human rights, i.e. economic and social rights, grounded in the notion that government has affirmative obligations to protect individuals from deprivation of the basic material necessities of life. Food security is a typical example of social rights (Messer and Cohen, 2007).

All these good reasons for fighting climate change remain unrecognized by current food policy, which fully complies with the dictates of neoliberalism. Neoliberalism represents a new particular political economic approach in liberal systems of modern capitalist societies, which in the 1970s replaced the previous approach of embedded liberalism (Harvey, 2005). According to embedded liberalism, the economic sphere is embedded in the social and political spheres, and the state has the mandate to intervene in the economy with regard to a variety of goals beyond allocative efficiency; such as distributional and political goals. On the contrary, according to neoliberalism, the economic sphere is independent from the social and political one and states ought to abstain from intervening in the economy, allowing individuals to participate in free and self-regulating markets. In the case of food policy, these two perspectives lead to a very different choice of goals and instruments. There are two major differences between the two political views. The first difference is that, while embedded liberalism is consistent with both the economic and the political/ethical rationales for public intervention, neoliberalism only accepts the economic rationale. In other words, while embedded liberalism awards distributive and social goals a prominent place in the food policy agenda, the only goal accepted by neoliberalism is economic efficiency. An important consequence is that neoliberalism does not foresee any form of intervention in order to uphold individuals' right to food, which would respond to objectives of social justice rather than of economic efficiency. The second difference is that, in the case of market failures, while neoliberalism only acknowledges market-based instruments – such as taxes and incentives, privatization and self-regulation (Backer, 2008) – embedded liberalism acknowledges a large set of instruments, including all types of state direct and command-and-control interventions, such as standards, regulation and state participation in economic activities.

Besides reducing the scope of state intervention, neo-liberalism, because of its broad implementation at a global level, has changed real economies and political institutions in such a way as to accelerate processes of climate change. In the food sector, neo-liberalism has produced the shift towards the particular organization and division of labour of the third food regime. The concept of food regime, developed within the world-system research strain, helps to understand how the international division of labor in agriculture as well as food policy depend strictly on the process of capitalist accumulation. The basic definition of food regime is 'a rule-governed structure of production and consumption on a world scale' (Friedmann, 1993). A particular food regime is characterized by a hegemonic power which is able 'to dictate the rules'. So far, literature on food regime has described three regimes. In the first regime, spanning the period between 1870 and 1914 and designated as ' Settler-Colonial', Britain inaugurated the policy of 'cheap food' for the industrial working class, based on the imports of basic grains and livestock from settler colonies. In the successive food regime, the 'Surplus' regime, between 1945 and 1973, the Unites States, under the umbrella of food aid programs, invaded their informal empire of postcolonial states with their food surpluses, seizing them in the grip of external debt. The second food regime actually ended with the demise of Bretton Woods. Since then, the neoliberal regime has initiated. The neoliberal food regime (McMichael, 2009) -sometimes also referred to as 'food from nowhere' regime or 'corporate' food regime- has produced a new international food order, characterized, inter alia, by: (1) a high level of consolidation at the manufacturer and retail level, with a dramatic rise of corporate power; (2) an international division of labor based on the organizational features of global food commodity chains, with the rise of export zones in the global south and the displacement of independent producers and small scale agriculture; (3) an increasing market differentiation, with low-quality mass products alongside 'high-tech/high quality' rich products;

(4) bio-nano technologies and intellectual property rights as the new frontiers for profit extraction; (5) the accelerated depletion of natural resources. All these characters make the current global food system strongly dependent on oil and massively contributory towards climate change (Shiva, 2008).

Following the tracks of the previous regimes, the neoliberal food regime continues the process of integration of the food production and consumption activities into the processes of industrialization and capitalistic accumulation. Nevertheless, there is a profound difference between the previous and the third food regimes. Unlike the previous food regimes, where the hegemonic powers were nation states (the UK first followed by the USA), in the third regime hegemonic power is exercised by the large TNCs which control the global food chains. In other words, with the rising of the neoliberal regime, there has been a shift from state to private food governance. With neoliberalism, private interests no longer 'capture' (following Stigler's definition) state regulation, but in fact they substitute the state by becoming themselves the regulators of the economy (and of society). In other words, food policy neoliberalization has entailed the shift from direct state regulation to private governance (i.e. privatization, self-regulation, and corporate social responsibility), on the grounds that market (which is deemed to coincide with the private sector) is always better than planning (deemed to coincide with the state).That this is not actually the case has been largely clarified by a good deal of literature produced on the issues of private governance and the erosion of state authority due to neoliberal globalization. This literature has demonstrated that waiving of state planning and authority has not resulted in a more decentralized and free socio-economic organization but rather an authoritative undemocratic system led by the private planning of TNCs (Hall and Bierstker, 2002), a sort of private international regime. With respect to the food sector, the emergence of private governance has been described through the analysis of the retail revolution and the emergence of third-party certification (Van der Meulen, 2011). Recently Fuchs and Kalfagianni (2010) have conceptualized the governance of the agrifood system as a field of power struggles between various global and local actors, explaining the rise of retail private governance on the grounds of structural and ideational power. Structural power refers to the control of material resources (mainly financial means), while ideational sources of power are located in the actor's ability to influence the framing of political issues and to constrain behaviors and actions, drawing on the symbolic meaning of social practices and institutions (Fuchs and Glaab, 2011). Assessing consequences of private food regulation, Fuchs and Kalfagianni (2010) conclude that the rise of food retail governance may 'have serious consequences for two fundamental attributes of global food governance, namely environmental sustainability and food security, with the vulnerable and marginalized rural populations being the most severely affected groups'.

In conclusion, literature on food regimes and private governance help to highlight two important false tenets of the neoliberal ideology which prevent food policy from effectively addressing climate change related issues in the food sector. One tenet is that the food system is organized as a system of efficient markets where exchange relations are not 'corrupted' by power asymmetries and opportunistic behaviors. The second tenet is that the only rationale for state intervention in a democratic society is the preservation of free markets. Markets, on the basis of the particular form of utilitarianism endorsed by the neoclassical economic theory, are deemed to be able to coordinate agents' behaviors without the requirement of value judgments and moral duties. Once these falsifications are unveiled, showing that the food system is indeed populated by powerful subjects who impose their will and their peculiar values on other subjects – keeping the system stuck in an unsustainable pattern – it is necessary to investigate what ethical theories, alternative to utilitarianism, could support food policies aimed at contrasting climate change.

Looking for a way out: some ethical open issues

The shortcomings of the neoliberal project in dealing with critical issues such as global warming have been extensively analyzed and denounced by heterodox scholars as well as representatives of social movements. Within the anti-globalization movement a large network of non-governmental and civil

society organizations, farmers and indigenous peoples have discussed and promoted alternatives to food neoliberal policies and suggested pathways which move towards a sustainable climate-friendly food system. Outstanding examples are the La Via Campesina movement, the Local Economy Movement and the agro-ecological project (Borras, 2008; Mount, 2011; Posey, 2011).

Beyond their diversity and multiplicity, alternatives proposed by different subjects share a common view of the main goals and instruments able to 'adjust' the perverse food-climate relationship. This common view may be summarized in the following points, which form the pillars of the alternative vision: fighting climate change is a matter of social justice; food is a human right (in other words, food for community instead of food as commodity); a sustainable food system needs smallholder farmers, rural economies, local markets, and non fuel-dependent agronomic practices; the overwhelming corporate power and the consequent phenomenon of private regulation must be opposed because of the risk they pose to democracy and the environment; trade liberalization should not occur to the detriment of food sovereignty.

Notwithstanding these clear statements and the strong political commitment of social movements, the counter-neoliberal food agenda still remains a utopia, with little progress made at legislative level and in the real economy. One cause of this failure is undoubtedly the existence of consolidated centers of political and economic power backing neoliberal policies; nevertheless, there are also important causes of a theoretical nature, among which the difficulties encountered by alternative approaches in providing a consistent ethical theory able to support their prescriptive analysis, analogous to the case of utilitarianism and neoclassical welfare economics.

Following the neoclassical economic theory, neoliberalism endorses a preference utilitarianism based on the assumption of perfect rationality. Unlike the classical Benthamian utilitarianism aimed at achieving the greatest happiness of the greatest number, this crude form of act utilitarianism promotes actions that fulfill the individual interests (preferences) of those beings involved and, assuming the non measurability of utility, does not offer a moral justification for welfare policies. Utilitarianism, and in particular preference utilitarianism, does not help address the main ethical issues raised by climate change (Barker *et al*., 2008): equity, across social groups living today and across generations; moral accountability in case of uncertainty and risk (for example in the case of controversial forecasts on the effects of global warming), as assumed instead by the precautionary principle endorsed by Jonas' imperative of responsibility; the upholding of human rights; the recognition of the intrinsic value of human life and nature; the recognition of the rights of nature; choice problems in case of trade-offs between different policy options and redistributive problems. Given these shortcomings of utilitarianism (at least of the narrow utilitarianism endorsed by welfare economics), innovative policies against climate change need to be based on different ethical foundations. Leaving aside less radical forms of consequentialism (as, for instance, rule utilitarianism or utilitarianism based on meta-preferences), which possess almost all the same limits as preference utilitarianism, alternative approaches, such as deontological and virtue-based theories, seem to better fit the policy programs suggested by the opponents to neoliberalism. For instance, deontological ethics, which is about duties and universal norms, provides an option for tackling the dilemmas of guaranteeing positive rights, choosing the 'right' option in case of trade offs, and attributing *per se* values to nature and to the well-being of future generations. Common criticisms of deontological moral systems are that they are subjective, may give raise to paternalistic and anti-libertarian institutions, do not help choose between contrasting duties and rules, may lead to 'inefficient' behaviors (because they do not give enough importance to the consequences of actions). Moreover, they are refused by mainstream economists on the ground that, contrary to utilitarianism, they would make resource allocation dependent on value judgments instead of efficiency. These criticisms lose their validity when dealing with real problems of economic policy. First, as a matter of fact, mainstream economics is not value-free because it needs deontological ethics in order to justify and

to endorse the set of rights concerning property and contracts, which enable the market to develop and function (Van Staveren, 2007). Secondly, once the need for regulations to correct market failures has been recognized, where utilitarianism shows its limits, policy makers cannot help but rely on different ethical theories. An ordered society and a sustainable economy need rights and norms capable not only of protecting negative freedom, but also of promoting positive freedom and ensuring the survival of human beings and the planet and a decent life for everyone. In order to implement a food policy that gives top priority to the fight against climate change, thus safeguarding present and future food security, it is necessary to renounce the myth that utilitarianism is the guarantor of happiness and freedom of individuals, and embrace a deontological approach. The challenge is to devise institutions which enable a society of equals to identify and protect shared common values through a democratic confrontation. The theoretical debate has already proven that ethical theories alternative to utilitarianism may indeed help to build a sane food policy. Van Straven (2007) has argued for a virtue ethics which, emphasizing the interrelatedness of agents and commitment to shared values beyond the rules already institutionalised by a society, may help attain institutional innovation through processes of participatory democracy. Bagnoli (2007) has investigated the way in which a Kantian deontological stance, together with some recent models of human deliberative rationality developed by cognitive scientists, may accommodate autonomy and moral independence of individuals with their commitment to normative relations of mutual respect and recognition within society. Such a stance demonstrates that norms do not need to arise from non-cooperative games or from the will of a benevolent dictator, but may be the outcome of deliberative democratic processes. Other important tips come from care scholars (White and Tronto, 2004) who have widely criticized the myth of self-sufficient and autonomous human beings, showing how much everyone is dependent throughout their life on other people and on nature for their survival. The language of care in order to be politically viable must necessarily appeal to the concept of need beyond rights, and of moral sentiments beyond moral reason, opening the way to a wide range of fruitful interpretations of traditional deontological moral theories. When the duty to public care (with care conceived of as a public value) is extended to the natural environment and society at large, the insights from care literature may be applied to many moral dilemmas, (such as the rights of nature and the choice of discount rate for assessing the cost benefit ratio of mitigation strategies) which obstacle the implementation of firmer policies against global warming.

Conclusion

Notwithstanding the considerable contribution of the food system to GHG emissions and the fact that climate change puts food security at risk, current food policies at a global level do not recognize mitigation and adaptation policy as a priority. In the paper, the lack of intervention has been linked to the hegemony of neoliberal ideology which has nourished the myth of efficient self-regulating markets. Literature on food regimes and food private governance has instead shown how in the food system resources are not allocated by efficient markets, but through power by large TNCS, with consequent negative effects on environmental sustainability and social justice. In order to have a much more 'active' food policy (providing direct regulation, wealth redistribution and public goods) it is necessary not only to oppose the economic and political power of corporations but also to challenge the credo, critical to the success of the neoliberal project, that preference utilitarianism is the only viable moral theory consistent with the ideal of freedom of liberal regimes. In the paper some alternative views, embracing a deontological perspective, have been mentioned, such as the virtue ethics, a Kantian ethics underpinned by a self-reflexive deliberative rationality, and the ethics of care. Further research in these fields is required in order to provide economics with a moral theory consistent with social and political projects opposing neoliberal policies.

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Sustainable food policies for the EU27: results from the EUPOPP project

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Abstract

Developing policies to promote sustainable consumption (SC) is urgently needed, but a demanding task, especially in the need area of 'food'. To develop effective and coherent instruments and respective policies, the links between instruments influencing consumption patterns, cultural or lifestyle differences must be considered, and how changes in consumption patterns translate into impacts in terms of ecological, social and economic sustainability. The EU FP7-funded project EUPOPP focussed on the need areas of housing and food to identify best-practice policies to promote more sustainable lifestyle. The assessment of such policies must account for consumer action being interlinked with activities of other market players, and path-creating effects of technologies and systems of consumption and provision. The paper presents results from a multidisciplinary tool for the assessment of consumption policies which links policy analysis and material flow analysis. These impacts are derived from a baseline scenario against which sustainability effects of instruments for sustainable food in the EU-27 are quantified, especially 'bundles' of information campaigns, labels, incentives and regulatory instruments. Impacts of these different instrument bundles in the need areas of 'food' and 'housing' were explored at the EU level, while addressing the international dimension (e.g. trade effects) in parallel. The EUPOPP project developed a full life-cycle database for EU food consumption in 2010, and projections for 2020-2030. The material flow analysis for the sustainable consumption scenarios gives results for cost, GHG and air emissions, land use, and employment effect.

Keywords: food, GHG emissions, material flow analysis, scenarios, sustainability

Introduction

The EU FP7 collaborative research project 'European Policies to Promote Sustainable Consumption Patterns (EUPOPP)' engaged partner institutions from all EU regions:

- Coordinator: Öko-Institut e. V. – Institute for Applied Ecology, Germany;
- National Consumer Research Centre, Finland;
- University College London, UK;
- Baltic Environmental Forum, Latvia;
- ecoinstitut Barcelona, Spain;
- Institute for Social-Ecological Research, Germany;
- ICLEI – Local Governments for Sustainability, European Secretariat.

EUPOPP tackles the existing knowledge deficit in the policy arena of sustainable consumption and production (SCP) with regard to the effectiveness of sustainable consumption (SC) strategies and instruments. A focus is on policies in the need areas of housing and food. EUPOPP is based on an overall conceptual framework for portraying the relationships between SC policies, consumption patterns

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and sustainability. Under this umbrella the following questions were addressed and transformed into research hypotheses:

- What are consumption / production trends and what are the respective sustainability potentials of SC policies – in general and in selected need areas?
- How can impacts of policy instruments on sustainable consumption be assessed and how do they influence sustainable consumption – mainly in the need areas housing and food?
- What are conditions of success or failure that promote or hamper the impacts of a SC instrument on consumption patterns?
- What are options to enhance sustainable consumption policies and instruments?

EUPOPP addressed these research questions with an innovative mixed-methods approach, linking policy analysis with in-depth empirical research and material flow analysis. All deliverables and outputs can be found on the project website: www.eupopp.net.

Study approach

EUPOPP analysed data on historic and future consumption and production trends compiled earlier (EUPOPP, 2009) and extended those to future trends from 2010 onwards to 2030 to define the baseline (BAU) scenario which assumes only current trends in implementing SC instruments. The BAU scenario for food is using the CAPRI Outlook, a baseline scenario created for DG AGRI.

The SC strategy scenarios assume implementation of SC instrument bundles (OEKO, 2011b) which target daily activities, and – as changing of consumption and lifestyle habits need motivation and knowledge – consider informational and motivational elements. The most relevant target area SC interventions is the consumption of meat and dairy products, as both product groups entail high emissions, biodiversity loss, as well as land and water pollution. However, changes in dairy consumption are very hard to address due to the fact that dairy products are deeply ingrained in many diets and food styles, and that their sustainability depends on a variety of specific factors. Meat consumption, on the other hand, is a more 'generic' element of diets and food styles and can (partially) be replaced by nutrient-equivalent combinations of cereals and vegetables. For this reason, the key for instrument bundling in the need area of food is meat consumption.

EUPOPP developed instrument bundles which address both household food consumption and public catering, e.g. in school canteens. Since there are only very few mature instruments available for optimising in the need area of food, the scenarios include more consensus-building communicative instruments, presuppose more radical behavioural change, and include more innovative instruments than in the previous section.

- Green Public Procurement: Introduce requirements for low-meat meals in catering for public educational institutions, in combination with one vegetarian day per week.
- Pricing: Implement a consumer tax on meat products.
- Reducing wastage: Require retailers to expand the sell-by dates of food in retail, and promote customer information on best-use-before labels.
- Going organic: Raise the share of organic food through a combination of public procurement, mainstreaming availability in retail, and tax exemptions.
- Promoting sustainable diets: nutrition classes in school and advice in stores, in combination with other communicative / awareness raising instruments.

The SC-1 scenario assumes a 'moderate' ambition, i.e. only those SC instrument bundles are implemented which do not pose a major hurdle in terms of policy. The food instrument bundles in SC-1 assume a reduction of meat consumption of 20% by 2030, compared to the BAU scenario in which meat

consumtion is more or less stable. The instrument bundle for food takes into account the shifts between meat and cereals, dairy, vegetables and fish, i.e. the different nutrition values of meat and low-meat diets are considered.

The instruments' implementation is assumed to start in 2015, and reach their full effect by 2030. As meat is only one element of the overall diets in Europe, the shift to less meat induced by the instrument bundle affects just a part of the total food consumption.

The SC-2 scenario assumes a 'high' ambition, i.e. all SC instrument bundles are assumed to be implemented by 2030. SC-2 builds on the definition of SC-1, but adds a shift towards more organic food (from 20% by 2030 in BAU to 40%), and a reduction of household food waste by 10% (2030).

Key findings

Results of the BAU Scenario for food

In the BAU scenario, overall food consumption will slightly increase, especially for cereals, dairy, fruit and fish, while vegetables and sugar remain more or less constant. Meat is increasing also, but in this group beef demand levels off, while chicken increases further. From these demand dynamics, the quantified sustainability impacts were derived using the material-flow database established in the EUPOPP project for the EU-27.

The overall GHG emissions in terms of CO_2eq will increase slightly, while CO_2 and CH_4 emissions decrease, and N_2O emissions show a small increase (Table 1). Note that these results are given for the total life-cycles including emissions from outside of the EU, and including the energy use for production, processing and distribution of the food, but not the energy use for cooling and cooking in the residential households.

The MFA computation also gives impacts for the resource use, expressed in cumulated primary energy use, cumulated raw material use, and land use. Table 2 gives the respective results.

The land use associated with the EU food system, and the costs for delivering the food to the customers (at retail stores) will both rise, with the costs increasing far more prominently (Table 3).

The overall sustainability of the BAU sub-scenario for food in the EU-27 will – in terms of quantified results – not be improved, as both consumption levels and production systems will cause rising emissions, resource use, and costs.

Table 1. GHG emissions from EU food consumption, BAU scenario.

[million t]	CO_2eq	CO_2	CH_4	N_2O
EU food-2010	1,619	227	7.3	4.1
EU food-2020	1,645	227	7.2	4.2
EU food-2030	1,674	220	7.1	4.3

Source: own calculation using GEMIS 4.7 (www.gemis.de)

Table 2. Primary energy and raw material use from EU food consumption, BAU scenario.

Primary energy [PJ]	Total	Non renewable	Renewable
EU food-2010	3,617	3,467	150
EU food-2020	3,718	3,447	271
EU food-2030	3,661	3,370	290
Raw materials [million t]			
EU food-2010	3,088	116	2,972
EU food-2020	3,240	131	3,109
EU food-2030	3,264	139	3,125

Source: own calculation using GEMIS 4.7 (www.gemis.de)

Table 3. Land use and costs from EU food consumption, BAU scenario.

	Land use [million ha]	Costs [billion €]
EU food-2010	350	381
EU food-2020	370	446
EU food-2030	369	520

Source: own calculation using GEMIS 4.7 (www.gemis.de)

Results of the SC Scenarios

In contrast to BAU, the Sustainable Consumption (SC) scenarios assume the implementation of SC instruments and policies in the need areas of food and housing beyond BAU, i.e. more instruments and more 'intense' formulation and implementation of the instruments.

To model the impacts of the SC scenario, these instruments were be quantified in their effects and – to facilitate modelling – 'bundled' into aggregate policy sets for the respective need areas. As described in OEKO (2011b), the SC scenarios consist of SC-1 and SC-2 which assume a different 'ambition' in implementing the available SC instruments:

SC-1 assumed moderate-to-high ambitions, while SC-2 assumes very high sustainability ambitions in both need areas, making full use of all the SC instruments identified. As for BAU, the quantified sustainability impacts of the SC scenarios for food were calculated using the life-cycle emissions factors of food provisioning to the retail sector (see Table 4).

The MFA computation also gives impacts for the resource use, expressed in cumulated primary energy use, cumulated raw material use, and land use (see Table 5).

The cumulated primary energy use will decrease in all SC scenarios, with a decrease in non-renewable and an increase in renewable energy sources used by the EU food system. The results for the raw material use show an increase for SC-1, both for non-renewable and renewable raw materials, while SC-2 will result in a reduction of total and renewable raw materials and a small increase for non-renewable raw materials.

Table 4. GHG emissions from EU food consumption, SC scenarios.

[million t]	CO_2eq	CO_2	CH_4	N_2O
EU food 2010	1,619	227	7.3	4.1
EU food 2020 SC-1	1,621	224	7.0	4.1
EU food 2030 SC-1	1,624	214	6.8	4.2
EU food 2020 SC-2	1,546	213	6.7	3.9
EU food 2030 SC-2	1,474	194	6.2	3.8

Source: own calculation using GEMIS 4.7 (www.gemis.de)

Table 5. Primary energy and raw material use from EU food consumption, SC scenarios.

Primary energy [PJ]	Total	non renewable	renewable
EU food 2010	3,617	3,467	150
EU food 2020 SC-1	3,666	3,399	267
EU food 2030 SC-1	3,559	3,277	282
EU food 2020 SC-2	3,499	3,244	254
EU food 2030 SC-2	3,233	2,977	256
Raw materials [million t]	Total	non renewable	renewable
EU food 2010	3,088	116	2,934
EU food 2020 SC-1	3,175	128	3,010
EU food 2030 SC-1	3,134	133	2,961
EU food 2020 SC-2	3,027	122	2,870
EU food 2030 SC-2	2,841	121	2,683

Source: own calculation using GEMIS 4.7 (www.gemis.de)

BAU vs. SC in the sub-scenarios for food

In Table 6, the results of the BAU sub-scenario for food are compared with the respective SC scenarios both in absolute terms, and as relative changes between the SC sub-scenarios for food, and BAU sub-scenario for food. The data are given for the year 2030 when the assumed SC instrument bundles are fully implemented.

Beyond numbers: qualitative sustainability impacts

In addition, EUPOPP indicators also address non-quantitative impacts in a qualitative manner. For this, the changes in 'intensity' of relevant drivers were considered, focusing on land-use related biodiversity impacts, and social implications.

The land use associated with the SC scenarios is – slightly – lower than in BAU, and less of land is 'used' outside of the EU-27.

Table 6. Comparison of selected results of the food sub-scenarios, year 2030.

	unit	BAU	SC-1	SC-2	SC-1 vs. BAU	SC-2 vs. BAU	SC-1 vs. BAU	SC-2 vs. BAU
GHG emisssions								
CO_2eq	million t	1,674	1,624	1,474	-50	-200	-3%	-12%
CO_2	million t	220	214	194	-6	-25	-3%	-12%
Air emissions								
SO_2eq	million t	13.3	12.8	11.7	-0.5	-1.6	-3%	-12%
PM_{10}	million t	0.18	0.18	0.16	0.0	0.0	-2%	-11%
Primary energy								
non-renewable	EJ	3.4	3.3	3.0	0	0	-3%	-12%
renewable	EJ	0.3	0.3	0.3	0	0	-3%	-12%
Raw materials								
non-renewable	million t	139	133	121	-6	-18	-4%	-13%
renewable	million t	3,125	2,961	2,683	-164	-442	-5%	-14%
Other indicators								
Land use	billion m^2	3,686	3,654	3,230	-33	-456	-1%	-12%
Cost	billion €	520	513	510	-7	-10	-1%	-2%

But beyond the hectare data, the quality of the land use is important with regard to biodiversity: In the SC-2 scenario, the organic share of food consumed is assumed to increase significantly above BAU, so that far more agriculture will follow organic cultivation rules. Thus, the intensity of the land use in SC-2 will be lower than in BAU, and the reduced use of industrial fertilizers and the broader genetic variety of plants used in organic farming will contribute to agro-biodiversity. With less agrochemicals being applied, also ecosystem functions will be enhanced compared to BAU. Another important aspect is that in SC-2, more fish will come from certified aquaculture so that overexploitation of marine resources will be reduced.

Last but not least, the indicative quantification of employment should be seen as a qualifier in the social domain. Employment is less an economic indicator than an expression of inclusion in modern societies, and an opportunity for income generation. The analysis of the BAU and SC scenarios with regard to employment indicated that especially the SC-2 scenario will create more direct jobs in Europe, which will contribute to social development.

Some ethical considerations

Although EUPOPP did not explicitly consider the ethical dimension, the results allow interpretation in that regard. First, implementing the SC-2 scenario would – beyond the direct effects presented above – expectedly contribute to social justice within the EU27, as overall food cost (household expenditures) would be reduced slightly, and more of the food (and respective feed) would be produced within the EU27, improving (rural) income. Furthermore, the higher specific cost of organically produced food would be over-compensated by shifts in diets, making more environmentally sound and healthy food

more affordable for all. Second, the optimized SC instruments and supportive contexts for individual decisions and consumer behaviour assumed for the SC scenarios would create a more inclusive policy environment in the food (and retail) sector. EUPOPP pointed to the specific conditions of social difference, consumption related competencies and windows of opportunity that effect gender and consumer responsiveness. Our assessment shows, among others, that participative instrument design and a more focussed implementation are strengthening societal involvement and the inclusion of different consumer groups at all levels of sustainable consumption. Third, the international dimension of the EU food system would improve the distributional aspect of sustainability impacts, contributing to a more balanced development of international trade with regard to imports. The reduced material flows from 'outside' of the EU27 due to diet changes of EU27 households imply reductions of income generated in exporting countries, but the SC policy of increasing the organic food share would translate also to imports, thus counterbalancing the income reduction elsewhere. Furthermore, higher shares of organic production systems imply less health and environmental impacts in exporting countries, too.

Fourth and last, the quantified environmental impacts of the SC scenarios show not only a significant overall reduction compared to BAU, but also a reduction of emissions occurring outside of the EU27.

There would be no 'burden shifting' of e.g. GHG emissions towards other countries, but a higher 'domestic' share – which would still be lower than in the BAU scenario, though.

Conclusions

The overall sustainability of the SC scenarios for the EU-27 – in terms of quantified results – will be improved, as changes in both consumption levels and consumption pattern will reduce resource use, and costs. For GHG and air emissions, significant reductions compared to the 2010 levels will result which will help achieving the EU targets for climate protection.

The analysis of the international dimension of the scenarios indicates that for GHG and air emissions, renewable energy and land use, the overall origin is within the EU-27, i.e. the domestic shares dominate the patterns. For non-renewable primary energy and nor renewable raw materials, the import shares form outside of the EU are around 50%, i.e. approximately half of the sustainability impacts will occur outside of the EU.

The full implementation of all assumed SC instruments in the SC-2 scenario will allow increasing the domestic shares both in relative and absolute terms, thus reducing the pressure on climate, air, land and respective impacts from non-renewable primary energy and raw materials. Thus, the SC scenarios do not imply any burden shifting from the EU towards abroad, but contrarily contribute to more equity.

A balanced policy mix could therefore avoid potential negative tradeoffs which would have raised critical ethical (and policy) questions of equity in the international context. Well-designed SC policy packages can not only reduce the 'market' rebound in terms of demand, but also the 'spatial' rebound in terms of international trade.

Still, the external shares of non-renewable primary energies and raw materials remain high even by 2030. This result indicates that SC instruments for food and housing are important, but will not be sufficient to allow for a full 'internalization' of sustainability burdens within the EU-27 borders

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An ethical argument for vigilant prevention

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Abstract

In general, prevention is considered an epidemiologically good strategy because it decreases the likelihood of animal disease outbreaks (and thus epidemics), mainly by hindering the infectious agent spread and thereby lowering the number of diseased animals and the economical losses. Similarly, surveillance, i.e. monitoring and early detection of diseased animals, is generally considered as an epidemiologically good strategy because it increases the probability of controlling the outbreak before it reaches an epidemic scale. Both prevention and surveillance are proactive rather than reactive approaches, but there seems to be no clear *a priori* advantage of prevention over surveillance or vice versa. Nonetheless, some suggest that prevention offers better disease control results than surveillance and thus that both can be mutually exclusive. This discussion paper challenges this assumption and argues that both approaches should be seen as complimentary measures rather than opposing actions. A blended strategy that builds upon synergies between the prevention and surveillance approaches, will offer a stronger defense against epidemics than a single approach. The specific combination of prevention and surveillance measures depends on a series of factors, of which availability of technological innovations and economic benefits can be one. To bridge the suggested dichotomy between prevention and surveillance, we use a set of ethical arguments comprised of three principles: the 'right-to-know', the 'right-not-to-know', and the 'duty-to-know'. For important animal diseases and with the emergence of advanced diagnostics/monitoring technologies, the balance between these three principles shifts away from the right not to know towards a duty to know. This set of principles thus demonstrates the importance of surveillance within the overall strategy. We argue that, in a combined disease control strategy, prevention must be the most important component, which we would therefore term a 'vigilant prevention strategy'.

Keywords: epidemiology, animal disease prevention, animal disease surveillance, animal disease control

Introduction

Preventive measures, by definition, aim to lower the likelihood of disease outbreaks, and therefore epidemics. In the (unlikely) event of an outbreak, the preventive measures will decrease the successful spreading of the agent or vector and thus lower the impact of the disease outbreak. It is – by these standards – an epidemiologically good strategy.

One would expect this strategy to be economically beneficial as well, as a lower number of diseased animals is normally less costly. The grave differences between diseases and between different prevention methods, make it impossible to extend this conclusion to all prevention strategies for all diseases. As an example, the EU decided in the late 1980s to stop vaccination against Avian Influenza based on economic arguments, suggesting that prevention can sometimes be more costly. We will not investigate this issue in this paper as this would lead to a very technical discussion of a very specific case.

An analogous argument can be made for the surveillance approach in general. Early detection of diseased animals will increase the probability of controlling an outbreak before it reaches an epidemic scale. It is therefore an epidemiologically good strategy. Similarly as before, not all surveillance strategies seem equally economically sound (or beneficial) for all diseases.

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If neither has a clear a priori advantage, the question arises why some assume (or suggest) a contradiction or inherent dichotomy between prevention and surveillance. For example, in 2011 a veterinary society in Belgium organised a symposium titled 'Is prevention better than surveillance?'. Nevertheless, it seems that there is no inherent reason why prevention and surveillance should be mutually exclusive, as it is perfectly possible to install preventive measures and a surveillance network at the same time. Therefore, this paper targets the question 'How should prevention and surveillance be balanced?'

The specific combination of prevention and surveillance can then depend on a series of factors, of which we will discuss the ethical arguments. The set of arguments used in this paper has been applied to veterinary issues before by Evers *et al.* (2008), and related discussions have been introduced to the epidemiology society by Hartnack *et al.* (2009) and Dürr *et al.* (2010).

Analysis framework

First, we consider prevention and surveillance (always remembering that these are not fixed sets of measures) with regard to four principles: beneficence, non-maleficence, autonomy, and justice. This principlist approach, coined by Beauchamp and Childress in 1979 (see Beauchamp and Childress, 2001), emerged from the medical ethics discussion, but has been introduced in agricultural and veterinary ethics by Mepham in the 1990's in his Ethical Matrix (Mepham, 1996). The non-maleficence principle is an obligation not to inflict evil or harm on others. The principle of beneficence refers to actions done to benefit others, for instance, it requires that we not only prevent and remove harms to other human beings and animals but that we also contribute to their welfare. Acts of beneficence are often not obligatory. As Beauchamp & Childress already indicate, the obligations not to harm others could in particular circumstances become more stringent than the obligation to help them, but in another context it could also be the opposite. Furthermore, the non-maleficence principle can simply be met by doing nothing, while the principle of beneficence requires active actions to promote the legitimate interests of both other human beings and animals. Respect for autonomy is the obligation to value autonomous choices and actions of human beings. Beauchamp & Childress define autonomous action in terms of agents 'who act (1) intentionally; (2) with understanding; and (3) without controlling influences that determine their action' (Beauchamp and Childress, 2001: 59); this clearly needs to be redefined or reinterpreted for use with respect to animals. Respect for justice is the moral demand for a fair access to and distribution of services and goods. It requires that equal cases are treated equally.

In medical ethics priority is given to autonomy on which 'informed consent' and 'refusal' are based. Autonomy refers to self-governance, meaning at minimum being free from paternalist influences and from information deficiency, hindering intentional action and making responsible choices. In animal ethics, priority is given to the principles of non-maleficence and beneficence.

Next, we turn to a debate on rights and duties, which reflects the tension between the fore-mentioned principles: the 'right to know' (reflecting the principle of autonomy), the 'right not to know' (also reflecting the principle of autonomy), and the 'duty to know' (reflecting the consequence of the principles of beneficence and non-maleficence). Respecting autonomy is considered by Beauchamp & Childress as a prima facie obligation. It could be overridden by other considerations, such as concern for public health and personal health. In those cases we have proportional reasons for restricting in a justifiable manner the respect for autonomy.

The autonomy-paternalism dilemma

In essence, the 'right-to-know', the 'right-not-to -know', and the 'duty-to-know' discussion is an autonomy-paternalism dilemma: in specific circumstances (e.g. the possible outbreak of high-impact

animal diseases) the farmer's autonomy conflicts with the disease management authorities' paternalism. Highly infectious diseases, the availability of surveillance technology, and high public alertness and awareness favor the overruling of the fundamental choice of farmers to choose between a right-to-know or a right-not-to know attitude. In other words, initially it seems farmers have the right to use surveillance (the right-to-know) in order to be informed about the health status of their herd, but also the right not to use them (the right-not-to-know). Respecting the farmer's autonomy is a prima facie obligation. The question rises then whether there are proportional reasons to change this initial ethical position and coerce the farmers to choose for surveillance technologies that help detect diseases at an early stage and thereby protecting the animals 'well-being' (duty-to-know)? What if individual's autonomy and governmental beneficence clash? As stamping-out strategies sometimes require massive amounts of money, personnel, and other means; in the recent past disease management authorities have felt the need to be informed about disease outbreaks at the earliest possible moment. Since public health is one of the concerns of the common good (*bonum commune*) for which governments are supposed to take responsibility (beneficence), they are urged to infringe the farmer's individual right-not-to-know. Governments are requested by their citizens to improve public health protection and to avoid unnecessary animal killing. Furthermore, governments will be likely to enforce a duty-to-know to reduce costs. Therefore, they have an increasing interest in management techniques, which minimise stamping-out strategies in case of an outbreak. Since they have a duty-to-know, governments can perform better as they are informed about the disease status early in the outbreak.

Feinberg's distinction between hard/strong and soft/weak paternalism is helpful in this regard because it reframes the dilemma in terms of proportionality (Feinberg, 1986). The Oxford English Dictionary defines paternalism as 'the principle and practice of paternal administration; government as by a father; the claim or attempt to supply the needs or to regulate the life of a nation or community in the same way as father does those of his children.' Apart from the fact that the analogy with the role of the father dates from the second half of the eighteenth century, the idea of a parent acting beneficently towards his/her children and taking decisions on behalf of them is interesting. In our case on disease outbreak, one may expect that governments have superior knowledge and insights about the consequences of an outbreak. Since governments have an authoritative role we have to accept some paternalist actions overriding and restricting autonomous choices even if it involves the intervention in a particular person's preferences and actions.

At this point we could reinterpret paternalism as the intentional overriding of the farmer's preferences and actions, because the institution that overrides these preferences justifies the action by the goal of benefitting both citizens and animals, and by avoiding harm as much as possible. Intervention is thus justified on motives of beneficence and non-maleficence. Paternalistic interventions refer to a proportionalist weighing between avoidable harms and benefits at one hand and at the other hand the loss of autonomy and the invasiveness of the intervention. It seems evident that a kind of soft paternalism, inspired by beneficence and non-maleficence, is justified. But the real question is: under what circumstances and to what extent may we give up autonomy and respect for autonomous choices in order to benefit citizens and living animals? Is there a necessity to leave soft paternalism and opt for hard/strong paternalism in this case? If we want to protect both citizens and animals, from any harm done 'to them beyond their control', by avoiding a massive stamping-out strategy, then it seems to us that society is moving towards a strong paternalism in this matter.

Discussion

The rightist approach exposes an interesting conflict between the practical implications of the rights and duties of individuals and authorities (societies). From our further analysis of the duty-to-know argument in the case of farmers, infringement of their autonomy seems likely. Thus, the ethically inspired duty-to-

know would overrule the livestock producers' initial right-not-to-know, which in practice means the balance in the autonomy-paternalism dilemma shifts towards the latter.

If we move to a strong(er) paternalism, following from the government's strong incentive to have information on the country's disease situation, this means the rights/duty approach suggests the importance of surveillance within the overall disease control strategy (in the specific circumstances mentioned above).

After using this set of ethical arguments, we are left with the intriguing situation that even given that preventive measures (such as vaccination), by definition, have a significant impact on the likelihood of a disease outbreak, there is a strong argument for surveillance measures. A well-chosen blended strategy is therefore inevitable, and worthwhile. Such a combined strategy may build upon synergies between the two approaches, and may offer a stronger defense against epidemics.

Conclusion

Fundamentally, we insist that one should not imply any antagonism between prevention and surveillance. Moreover, blended strategies can be synergetic.

Arguing from a set of rights and duty principles (the 'right-to-know', the 'right-not-to -know', and the 'duty-to-know'), we showed that for important animal diseases and with the emergence of advanced diagnostics/monitoring technologies, the balance between these three rights shifts away from the right not to know towards a duty to know. This set of principles thus demonstrates the importance of surveillance within the overall strategy. Within a combined strategy, surveillance should not be neglected, and therefore we suggest the term 'vigilant prevention strategy'.

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Liability versus responsibility: the food industry case

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Abstract

The distinction between safety-related issues and health-related issues is essential, particularly in relation to the food industry. In this article, we will be discussing health-related issues and their significance within the context of long-term risk management in the food industry. When we deal with a health-related issue that develops gradually, and when a large number of food producers and various risk factors are involved, one cannot clearly point to the single link in the food production chain that is responsible for the damage. Moreover, the consumer and his/her eating patterns – are definitely part of the overall reasons that are likely to bring about some form of damage to his/her health. The inability to point to the single factor responsible for the damage is often used as an excuse by the food industry in order to release it from any moral responsibility for the damage caused to the health of its clients. Moral responsibility and causal responsibility are distinguished. The moral responsibility befalls the autonomous person – the one who is free to choose his actions. In this context, there is no doubt that the food corporations have far more freedom of action than the consumer. Thus, even if it makes sense to downplay their responsibility for the health damages themselves, one cannot do so regarding their responsibility to do all they can in order to prevent these damages. This calls for making a distinction between laying moral responsibility and guilt on the person who caused the harm, which is why he has the responsibility to avoid it (or to compensate the victim), and the obligation to contribute towards reducing the harm, regardless of the identity of the person causing the harm. The context of this discussion leads us to the conclusion that the food corporations have liability to the health status of their clients.

Keywords: health, liability, safety, responsibility, risk

Food consumption, which is vital for the body, means that many harmful elements also enter our bodies. The harm is sometimes immediate, as with food poisoning – in this case, we are talking about food-safety. On the other hand, the harm may take time to develop, as in the case of obesity – in this case, we are talking about health. The distinction between safety-related issues and health-related issues (Boatright, 2008) is essential, particularly in relation to the food industry. In this article, we will be discussing health-related issues and their significance within the context of long-term risk management in the food industry.

Where safety is concerned, it is a pretty unanimous notion that the people responsible for making/producing food, selling it, and/or serving it should do so while alerting consumers to any situations that can cause immediate acute harm. This is the sole responsibility of the food producers and marketers, even in cases where finding and removing the harmful component are a complex task subject to regulation. The U.S. Food and Drug Administration (FDA) (FDA, 2011) has a specific list of demands, obligating food producers and marketers to act in a way that will prevent, or significantly reduce, risks to consumer health. Cheese suppliers are not only obligated to provide cheeses that are fresh when they're bought. They must also print on the package the last date to open the product, and how long it can still be used safely after opening. When it comes to eggs, the FDA (FDA, 2010) dictates procedures that can ensure that the levels of Salmonella (naturally found in eggs) will not be high enough to cause the smallest stomach ache, let alone food poisoning. The examples are numerous and varied, and anyone dealing with food production or marketing is familiar with the Hazard Analysis & Critical Control Points (HACCP). Indeed, the regulatory system deals admirably well with safety concerns- it spots risks, isolates the components that can cause damage, and in fact identifies the factor causally responsible for

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the damage. Identifying the causal responsibility leads regulators to impose moral responsibility, which translates to legal responsibility, on every link in the chain of food supply where risk factors can form.

One should remember that moral responsibility neither always appears, nor totally disappears, as a result of the presence or absence of causal responsibility. The moral responsibility befalls the autonomous person – the one who is free to choose his actions (Benson, 1990). The various components of the food industry are able to efficiently prevent risk factors from entering during and after production, whereas the consumer cannot know the processes, ingredients, and places that the product has been involved in.

Surprisingly (or maybe not), when it comes to health-related issues, people aren't quick to hold the food producers and suppliers responsible. Safety-related issues include cases of severe illness and acute health damage; we will use the term 'health' to describe food risks that lead to a different kind of damage. This kind of health damage develops over time, and even if one could identify the majority of its causes, it is impossible to isolate one specific component as causally responsible. In this context, many processes in the food industry can impose health risks.

Undoubtedly, the obesity epidemic is the most significant and severe example of foods and eating patterns bearing the causal responsibility for health damage. Obesity is usually caused by consuming food with more calories than the body uses. When excessive food enters the body, some of it is stored as fat, and when this pattern of food intake versus physical activity continues over time, the body accumulates excessive weight. Apart from weight gain, obesity is often accompanied by Metabolic Syndrome, characterized by increased 'bad' versus 'good' cholesterol, higher levels of triglycerides, high blood pressure, insulin resistance, and diabetes (Janet, 2006). This process does not depend solely on the amount of food intake, but on its composition as well- foods rich with refined carbohydrates, sugars, and fats accelerate the process of Metabolic Syndrome. The Syndrome can lead not only to heavy, cumbersome bodies, but to various diseases such as cardiovascular disease (including heart attack and stroke), type 2 diabetes, different cancers, obstructive sleep apnea, and more. These processes are not rare, unfortunately, and obesity is now considered a growing epidemic. According to the (WHO) World Health Organization (WHO, 2011), obesity rates have doubled since 1990; in 2008, an estimated 1.5 billion people were overweight, of which 500 million were obese. In 2010, there were over 43 million obese children under the age of five.

The obesity epidemic is a huge financial burden. Health costs of overweight people are 30% higher than those of normal-weight people (Withrow and Alter, 2011). The obesity-related medical costs in the U.S. were estimated to grow from $78 billion in 1998 to $147 billion in 2008 (Finkelstein *et al*., 2009). This destructive trend is projected to continue in future years.

In those processes the long-term health damages and their financial implications are easily recognizable. When a large number of food producers and various risk factors are involved, one cannot clearly point to the single link in the food production chain that is responsible for the damage. Moreover, even the last link in the chain- the consumer and his/her eating patterns- are definitely part of the overall reasons that are likely to bring about some form of damage to his/her health. The inability to point to the single factor responsible for the damage is often used as an excuse by the food industry in order to release it from any moral responsibility for the health damage caused to its clients. The industry is not burdened with the responsibility to prevent this damage, and it is not perceived as liable for the financial costs of medical care, nor the greater economic consequences of hurting the health of millions.

The various systems that try to deal with health damages use three main approaches:

1. Educating consumers to consume food in a more health-conscious manner, and encouraging physical activity.

2. Obligating food manufacturers to accurately print the ingredients on the package, so the consumers can know the caloric value and composition of the product, and hopefully consume foods less dangerous to their health.
3. Attempting to tax foods with large amounts of sugars and saturated fats, considered to be harmful to one's health. Sometimes, not selling certain products to certain populations, such as not allowing the sale of sodas and candies at schools.

Regardless of their failure to curb health damages and their financial costs, these approaches have an important thing in common: they treat the problem from the consumer's side, trying to encourage him/her to reduce the consumption of harmful foods. Though it is not explicitly stated, they in fact hold the consumer responsible for maintaining his/her health. Eating is obviously a significant causal component in the process of health damage- the damage would not be caused without consuming the foods with the harmful ingredients.

It is difficult to lay the responsibility for health damages on the suppliers, partially because responsibility is often accompanied by blame. 'The price of diminished blame is diminished responsibility' (Philips, 1987). The suppliers' side of the food marketed does not consider itself 'liable' for health damages. This liability is easy to avoid, considering the dispersal of causal responsibility. To get past this obstacle, our approach should deal with the question of responsibility and nullify the question of liability. Instead of asking who is to blame for the damage, or who is liable for health costs, we should ask how food-related health damages can be prevented. The answer to this question is clear. Food manufacturers, marketers, and corporations have more tools to change the situation than any other player. It is much harder for food consumers to learn the complexities of this industrial branch and make informed decisions. They do not have the tools to perform the research, and find out the impact of foods and additives on their health. The food manufacturers have not only the capacity and resources, but the ability to change. Safety products like ABS and airbags in cars would not exist had Volvo not invested in developing them. It follows that food manufacturers should bear the responsibility to change the situation because they can, and not necessarily because they are 'liable'. Laying the responsibility on those who can make a difference neither casts nor absolves from blame. It simply avoids the irrelevant question.

Even after neutralizing the liability landmine, some see the consumer as having as much responsibility as the food industry for the health damages. Are we, the customers of food corporations, really free to choose how much food enters our mouths? Are we actually able to choose its composition? Even if we do not accept Galbraith's (Galbraith, 1958) view, which states that consumer sovereignty is a mere illusion, it is clear that the consumer's autonomy in relation to the food industry is very limited, certainly in comparison to the manufacturers' and suppliers' autonomy. As in all modern economic systems, the food-consuming public can choose from what is offered. Previously, 'nature' offered its gastronomic selection, whereas the foods we are offered today are artificial, rich in refined carbohydrates and saturated fats. The food industry is controlled by large corporations that aim to maximize their profits. They try to do so using the simple economic logic of increasing sales to increase profits. In order to increase sales, the customers have to buy more products. And what will they do with these products? When it comes to food, the only reasonable use is putting it in your mouth. It has been known for 30 years that eating less is healthier. And yet, the food industry is still 'stuck' in processes that accommodate truly degradable materials, rather than materials that stay in the body. Marianne Nestle (Nestle, 2002) not only blames the food industry as the central cause of bad eating habits, but shows that the heads of the industry are systematically perpetuating the status quo to maximize their profits. Fatty and sweet food tastes better, is easier to get used to, and is surprisingly cheaper to produce. Using additives allows manufacturers to concoct any product they can think of, and genetic engineering ensures that there is no shortage of raw materials. Empirical study by Levitsky and Pacanowski (Levitsky and Pacanowski, 2011) supports the notion that consumers have no 'free will' in what food they consume:

> The data presented above indicate clearly that an individual's decision to eat is not a result of personal weakness, but rather is determined, to a great extent, by the many environmental cues that have emerged since the early 1980's as a consequence of the commercialization of food. (Levitsky and Pacanowski, 2011)

There is no doubt that the food corporations have far more freedom of action than the consumer. Thus, even if it makes sense to downplay their responsibility for the health damages themselves, one cannot do so regarding their responsibility to maximize efforts to prevent these damages. Just like someone who happens to arrive at the site shortly after an accident can help with the wounded whom he did not hurt, the food industry has the tools to prevent harming the health of its clients. It therefore has the obligation to contribute towards reducing the harm, regardless of the identity of the person or entity that caused it. The context of this discussion leads us to conclude that the food corporations bear a liability in relation to the health status of their customers.

From an operational point of view, this means that the food industry should handle its business and carry out any necessary actions that may reduce the health hazards faced by its customers. Further, the industry can change to affect customer behavior, and lead them to acquire less harmful eating patterns. Just as any marketer knows how to make consumers favor his/her products, it is the moral obligation of the food industry to help its consumers favor healthier food choices.

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Integrated assessments of emerging food technologies – some options and challenges

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Abstract

The food and agriculture sector is experiencing rapid technological development. Some technological innovations are specific to food production, while other innovations are food related applications of generic emerging technologies, like biotechnology, nanotechnology, synthetic biology, etc. Consumers and the general public in Europe take a more or less cautious attitude towards this development. In order to secure public trust in the food sector there are established risk assessment procedures. Impact assessments may also be carried out, as well as ad hoc technology assessments. Emerging food technologies often involve a diversity of values and may have uncertain effects on both our health and the environment. This complexity indicates that there is a need for systematic and integrated assessments in this field. Integrated assessments have a long tradition in the context of sustainability and in this paper I draw on this discourse in a discussion of the place for integrated assessments in emerging food technologies.

Keywords: sustainability, food technologies, integrated assessments

Introduction

Emerging food technologies are a diverse bundle of technologies. A UK Food Standards Agency report on public perceptions of novel food technologies (Lyndhurst 2009) include GM foods, cloning, nanotechnologies, irradiation, functional foods, synthetic biology and novel food processes. Some of these categories are themselves broad, like nanotechnology. Only for nanotechnology in agriculture a Nanoforum report mentions

> new tools for the molecular treatment of diseases, rapid disease detection, enhancing the ability of plants to absorb nutrients, etc. Smart sensors and smart delivery systems will help the agricultural industry combat viruses and other crop pathogens. In the near future nanostructured catalysts will be available which will increase the efficiency of pesticides and herbicides, allowing lower doses to be used (Joseph and Morrison, 2006: 4).

For other food applications the Nanoforum report mentions 'smart packaging, on demand preservatives, and interactive foods. Building on the concept of "on-demand" food, the idea of interactive food is to allow consumers to modify food depending on their own nutritional needs or tastes.' (*ibid*. 7).

The Food Standards Agency report makes clear that the UK public in general is sceptical to novel foods: 'The overall tone of public attitudes towards emerging food technologies is one of wariness, unease, uncertainty, and sometimes outright negativity.' (Lyndhurst, 2009: 6). The Eurobarometer 2010 study on biotechnology (Gaskell *et al*., 2010) shows that not only the UK public, but also the European public in general, is sceptical to biotechnology in food production (in the report the two examples are GM food and animal cloning for food products). With regard to nanotechnology and synthetic biology people are largely uninformed, but still somewhat cautious.

In order to create public trust in food products all novel foods are regulated in the Novel Foods Regulation (EC 258/97) where it is stated that they shall be properly assessed with regard to health risks. But some

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of the various food technologies may also have other consequences than health risks. Some may have clear environmental aspects (like GM crops) and trigger environmental risk assessments, while others do not (like irradiation). Some may have ethical implications (like the worry about 'playing God' with regard to genetic modification and synthetic biology), while others do not seem to raise more 'inherent' objections. Some may lead to increased inequalities in a global perspective, while others have more local consequences. Some emerging food technologies related to agriculture will not trigger risk assessments, but may still have environmental and health consequences for animals and human beings (just like conventional agriculture and food production does). In the lack of legally mandatory risk assessments there may still be carried out other assessments. Impact assessments may be requested by the European Commission or national governments, and other institutions carry out less formalised assessments of technologies, for instance biotechnology advisory boards, technology boards and ethics committees. Such assessments may involve expert committee reports or the engagement of stakeholders, lay people and/or experts in different participatory processes (consensus conferences, round table discussions, etc.). They may also include scenario techniques, back casting, road mapping, etc. However, there are usually no requirements for such assessments; they are carried out based on requests from politicians or ministries, or based on the institutions own priorities.

Sustainability and integrated sustainability assessments

Because there are many different kinds of assessments, each with a particular objective and particular assumptions, revealing only a partial picture of reality, one may wish for a more integrated assessment framework that can be used in a systematic way on emerging food technologies. Such integrated assessments might help to avoid reductive decision making and unintended consequences of policy; and in this way build public trust in novel foods and innovative food production. Below I will discuss what a call for integrated assessment might amount to, but first I would like to point out that there is indeed a long tradition for integrated assessments in a European policy context, related to the overarching policy goal of sustainability. The EU Sustainable Development Strategy explains that sustainable development:

> ...is about safeguarding the earth's capacity to support life in all its diversity and is based on the principles of democracy, gender equality, solidarity, the rule of law and respect for fundamental rights, including freedom and equal opportunities for all. It aims at the continuous improvement of the quality of life and well-being on Earth for present and future generations. To that end it promotes a dynamic economy with full employment and a high level of education, health protection, social and territorial cohesion and environmental protection in a peaceful and secure world, respecting cultural diversity. (Council of the European Union, 2006: 2).

As described in a United Nations report (United Nations General Assembly, 2005) sustainable development is often portrayed, in a more simplistic way, as resting on three pillars, between which there needs to be a balance: economy, society and the environment. This means that in order to determine whether any particular practice, policy or technology is sustainable there is a need to do cross-disciplinary assessments that take into account all these three dimensions. There have been a host of approaches to assessing sustainability in an integrated way; some purely academic and some implemented into policy. The European Commission makes clear that its impact assessment system 'contributes to sustainable development by assessing the potential impacts of new legislation or policy proposals in economic, social and environmental fields through an *integrated approach*' (The European Commission, 2009: 3, my italics). The approach explicitly:

> replaces the previous single-sector type assessments and assesses the potential impacts of new legislation or policy proposals in economic (including competitiveness), social, and environmental fields. It consists of a balanced appraisal of all impacts... Wide-ranging consultation with stakeholders is an integral part of the impact assessment approach (http://ec.europa.eu/governance/better_regulation/impact_en.htm#_approach [Accessed 20.11.2011]).

In addition to its impact assessment system, the European Commission also carries out specific Strategic Environmental Assessments (SEA), as well as Trade Sustainable Impact Assessments, etc. with the same goal of integrating the three dimensions of economy, society and the environment. Sustainability assessments have been particularly used in the management of environmental resources, like air, water and land, and with regard to regional development actions.

Although the notion of integrated assessment is firmly established in policy, its meaning is not singularly defined. Scrase and Sheate (2002) have identified 14 different meanings of 'integrated' related to 'integrated assessments' in environmental governance: better coordination and dissemination of data; inclusion of specific environmental values into assessments; better coordination between high level and more local level governance; not isolating specific environmental problems at the cost of the whole; seeing regions as units of management; life cycle analysis; integration of business concerns into governance; integration of the three pillars of sustainability into governance; integration across policy domains; integrated computer modelling; integration of other stakeholders into governance; integration among assessment tools; integration of equity concerns into governance; and proper integration of assessment into governance. All of these interpretations have relevance for emerging food technologies.

Scrase and Sheate show that some of these meanings, like integrating business concerns into governance, are not likely to lead to more sustainable policies. They suggest that in order to secure environmental interests we should perhaps not seek integration as a balance between concerns, where economic concerns are given an equal position as social and environmental. In their opinion this might well reinforce the power of economic interests that already has been a prominent cause of environmental and social harms. This power imbalance might be a common problem with impact assessments and other forms of inclusive decision-making. When all stakeholders are allowed to participate, this may easily leave much room for influence by industrial interests, who usually have more resources to fund participation than consumer and societal organisations (CSOs) have. This criticism is directly relevant to the European Commission's integrated approach to impact assessment.

Scrase and Sheate's point, applicable also to potential integrated assessments of emerging food technologies, is that calling for integrated assessments will not necessarily lead to more sustainable or responsible developments. They also point to other, more generic, challenges of integrated assessment models such as oversimplification or a loss of transparency (Scrase and Sheate, 2002: 289). Scrase and Sheate's own position is that a better strategy would be to seek to understand 'path dependencies' determining decisions, and focus on the processes of learning that contribute to political and institutional change (*ibid*. 289). Still, we shall here assume that if designed and implemented in the right way, integrated assessment frameworks may be useful instruments for responsible governance of emerging technologies.

Integrated assessments of emerging technologies

Above we have seen that there are important insights from the context of integrated sustainability assessments. However, there are some particular challenges when transferring the integrated assessment models and discussions from environmental management to assessment of emerging food technologies. First, in the field of emerging technologies we should at least add one more interpretation to Scrase and Sheate's list where 'integrated' is interpreted as 'system learning focused'. Smits *et al*. (2010) point out that as innovation now generally is regarded as taking place in innovation systems (cf. e.g. Lundvall (1992)), rather than as a linear model from researcher to user, innovation policy and innovation decisions are made many places (from the level of intergovernmental organisations, the EU and national states, to regional governments, universities, innovation networks and individual companies). Moreover, emerging science and technologies are developed within a complex governance system consisting of actors from different ministries, directorates and national and international organisations.

For a 15th interpretation we can thus build on Scrase and Sheate's ideas about learning, but combine this more explicitly with the idea of complex innovation and governance systems. More than being an instrument for central planning, an integrated framework for assessment of emerging food science and technologies might thus instead involve connecting all these actors, together with stakeholders and citizens in learning networks. This is in fact related to the meaning of integration described for instance in the European Commission's communication 'Towards a European Strategy for Nanotechnology' (European Commission, 2004). Here it is recommended that societal considerations are integrated into the R&D process at an early stage, in so-called 'integrated projects'.

Second, when applying the discourse from the context of integrated sustainability assessments on integrated assessment of emerging science and technologies, increased attention must be paid to the issue of uncertainty. Although uncertainty is a well-known factor in future oriented sustainability assessments and impact assessments, such assessments are not designed to deal with science and technologies that are still not (or only to a small extent) realised. Here the uncertainties are much larger, both with regard to benefits, costs and risks. The anticipatory dimension of integrated assessments must therefore have a more prominent place.

Another danger is that a focus on assessing impacts of a specific technology might easily take the technology as a starting point, and not the problems we need to solve. For instance, with regard to nano sensors used in crop monitoring, perhaps it would be better to assess the variety of alternatives to better crop management, rather than assessing the particulars of nano sensors. If a technology focus is still chosen, this kind of deliberating on alternatives must be included as a specific step in the methodology. A similar danger, pointed out for instance by Selin (2011), is to take the industries' promises as starting point; assessing applications that never will be successfully developed, or only play a marginal role. Instead, Selin shows, assessments should involve 'negotiating plausibility'; i.e. determining what technology applications are plausible.

Sustainability assessments do not include specific deliberation on ethical issues of a more 'inherent' character; typically issues concerning 'playing God', respecting the integrity of human beings or animals, reverence for life, violating what is 'natural', etc. However, such issues may exactly be a great concern for people related to emerging technologies and an integrated assessment should include a possibility for deliberating on such issues in a systematic way that may actually impact assessment outcomes.

There are also practical questions, like of assessment scope. Is it possible to assess a whole bundle of technologies, like 'nano food technologies' in general? If not, how should the technologies be specified? Should the level of assessment be the local applications of each variant of the technology, because different technologies may have different consequences depending on local characteristics (for instance, types of ecosystems, animals or local societies)? But at this point most of the important decisions regarding the development of the technologies have already been taken, and it is only possible to influence minor issues (the so-called Collingridge dilemma, cf. Collingridge, 1980). Corresponding to these issues of scope, there are important institutional questions concerning at what level of public administration such assessment should take place; at the EU level, at the national level, at the regional level, or perhaps not at any of these? If not at the EU level, would it be a problem if there are differences in assessments across the EU?

Balancing social, environmental and economic concerns, or costs, risks and benefits, is the core of politics. The call for an integrated assessment is not a call for moving such deliberations out of institutionalised politics and into a technocracy-driven domain without democratic legitimacy. Many of the objections to emerging food and agricultural technologies are related to deeper value issues and political views, like questions concerning who should be in control of the technological developments in the food and

agriculture sector, to what extent the state should curb private initiatives or the freedom of consumers to choose, etc. These cannot be solved simply by developing the 'ideal tool', but a good framework for integrated assessments should provide the input needed for public discussion and decision making.

Conclusion

Above I have outlined the motivation for wanting a comprehensive assessment of emerging food science and technologies, and I have mentioned a number of different ways to understand how such assessments can be integrated. I have also briefly presented some challenges and questions that arise if such integrated assessments are called for. Here it has only been my intention to spell out some of the crucial issues. A newly funded European research project will address the challenges outlined above in much more detail. The project, called Integrated EST Framework (EST-Frame), will look at how four different case technologies are being assessed and determine the potential for a more integrated approach to assessment of emerging science and technologies. One of the case studies is nanotechnology in food production. In the case study existing assessments will be mapped, and their assumptions, strengths and weaknesses will be discussed. Through the case studies and project workshops we wish to clarify what the users and stakeholders believe is the need with regard to assessments in order to ensure responsible development of emerging science and technologies.

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Addressing farmers or traders: socio-ethical issues in developing a national action plan for sustainable crop protection

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Abstract

Member States of the European Union have an obligation to deliver a National Action Plan (NAP) on the sustainable use of plant protection products in 2012. The Dutch government started the process of drafting its NAP, in cooperation with public and private stakeholders, in 2011. The Ministry of Infrastructure and Environment and the Ministry of Economic Affairs, Agriculture and Innovation routinely took the lead in this process. Starting from existing networks, they invited the usual suspects in the agricultural and environmental sectors to join the process. However, recent analyses of Dutch public debates on pesticide residues revealed how confrontations between environmental and agricultural organisations tend to result in cooperation of retailers and food chain partners in adjusting production systems and product assortments to socio-ethical concerns about pesticide residues. The lesson learned was that farmers and traders depend on each other for achieving transitions to sustainable agriculture. Therefore, researchers participating in working groups of the NAP process flagged the crucial position of food chain partners when pesticide residues and transition to sustainable use of pesticides are at stake. These researchers thus used their knowledge and understanding of the dynamics of transitions in food chains to emphasise the socio-ethical urgency of including food chain partners in the NAP process. Merely urging farmers to improve their crop protection systems, notwithstanding the cooperation of food chain partners, would count as an unwarranted imbalance in the division of socio-ethical duties among the involved stakeholders (ought implies can). First, the paper will present a conceptual framework for transitions in food chains, as generalised from Dutch public debates on pesticide residues. Second, the paper will outline the impacts of interventions by researchers in the stakeholder working groups preparing the NAP for sustainable crop protection. Third, the paper will reflect on the socio-ethical challenges and pitfalls of including private parties in public policy-making processes.

Keywords: crop protection; food chain; multi-stakeholder governance; sustainable development; transition

Introduction

The Netherlands has a long history in reducing the use and risks of pesticides. In the period 1990-2000 the Multi-Year Crop Protection Plan was implemented. The main target of this plan was reducing the volume of pesticide use by 50%, as compared to the reference period 1984-1988. This target was achieved: the average use over 1998-2000 was 49% lower than the average use over 1984-1988 (Ekkes *et al.*, 2001). In the period 2000-2010 the Policy Document on Sustainable Crop Protection was implemented. The main target of this document was reducing the environmental impact on surface water by 95%, as compared to the reference year 1998. This target was partly achieved: in 2010 the environmental impact on surface water was 85% lower than in 1998 (Van Eerdt *et al.*, 2012).

The Multi-Year Crop Protection Plan (1990-2000) was prepared by eight working groups with experts from applied plant sciences, agricultural extension services, agricultural economics, and the Plant Protection Service (Ministerie LNV, 1990). The agricultural knowledge system thus dominated the process. The Policy Document on Sustainable Crop Protection (2000-2010) was prepared by policymakers and specialists of the Ministry of Agriculture and the Ministry of Environment. The

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ambitions for environmental risk reduction, integrated pest management and certification were tested in a large experiment with hundreds of farmers and growers. In 2003 the government entered into a multi-stakeholder agreement with primary producers, input suppliers and water quality stakeholders for achieving the targets for environmental risk reduction in 2010.

In line with the history of pesticide use and risk reduction plans in countries like Denmark, Germany and the Netherlands, the European Commission and the European Parliament adopted Directive 2009/128/EU in 2009 (European Union, 2009). This directive established a framework to achieve a sustainable use of pesticides by reducing the risks and impacts of pesticide use on human health and the environment, and by promoting the use of integrated pest management and alternative approaches or techniques such as non-chemical alternatives to pesticides.

The Directive obliges Member States to adopt National Action Plans with targets and measures:
- to reduce the risks and impacts of pesticide use;
- to reduce the dependency on the use of pesticides through the development and introduction of integrated pest management.

These targets and measures may cover different areas of concern, for example worker protection, protection of the environment, residues in vegetables and fruits, use of specific techniques, or use in specific crops.

The Dutch government started the process of drafting its National Action Plan, in cooperation with public and private stakeholders, in 2011. Two researchers of LEI actively participated in three working groups to formulate targets and ambitions for the National Action Plan.

These two researchers are agronomists by education with 15-20 years of experience in economics and sociology of crop protection. They actively participate(d) in European networks (ENDURE) and projects (Blight-MOP and PURE) on crop protection and pesticides. Some of the challenges in their studies at LEI are the development of entrepreneurship and sustainability in agriculture and the promotion of innovation processes by forming socio-technical networks. They are concerned about the degradation of soil quality in conventional agriculture (Buurma, 2009) and about the reluctance of both public and private stakeholders to consider the trade dimension of sustainability (Pollan, 2011)

Hence, the driving force behind the participation of the LEI researchers in the stakeholder process was that the food chain dimension deserves special attention in the next phase (2013-2023) of the transition to sustainable crop protection in the Netherlands.

The objectives of the two researchers for participation in the working groups were representing the socio-technical perspective in the process and getting an understanding of:
- the representation of public and private stakeholders;
- the contrasts in interests and ambitions of stakeholder groups;
- the socio-ethical issues related to these contrasting interests;
- the legitimacy of our efforts to promote the food chain dimension.

In the next sections a conceptual framework for innovation processes in food chains is presented, data collection and analysis are explained, the socio-technical results of the process are presented, and a reflection on socio-ethical issues is provided.

Conceptual framework

Buurma *et al.* (2003) found striking differences in the hierarchy of values between primary producers, food chain partners and knowledge partners, when referring to triple P interpretations of sustainable development (people, planet, profit). The primary producers had high scores in the categories of people and profit, the food chain partners in the categories of profit and planet, and the knowledge partners in the categories of planet and people. This pattern is shown in the triangle in Figure 1. More recently, Buurma (2011) found repetitive patterns in Dutch public debates on pesticide residues in fruits and vegetables.

This repetitive pattern happened to be also present in Dutch public debates on animal welfare in livestock production and is integrated in Figure 1, resulting in a flow chart for the dynamics behind transitions in food chains. The flow chart shows pressure coming from citizens, NGOs and the Ministry of Agriculture. These parties first commission knowledge partners to clarify the problem, and then challenge and/or push primary producers and value chain partners to improve production practices and product qualifications.

This conceptual framework motivated the two LEI researchers to participate in the stakeholder process of the National Action Plan. They recalled the stakeholder processes of the Multi-Year Crop Protection Plan (1990-2000) and the Policy Document on Sustainable Crop Protection (2000-2010), as shortly described in the introduction of this paper, and observed that value chain partners were hardly involved in these previous plans. Furthermore, they observed frustrations among primary producers about the lack of return on investment for improved production practices.

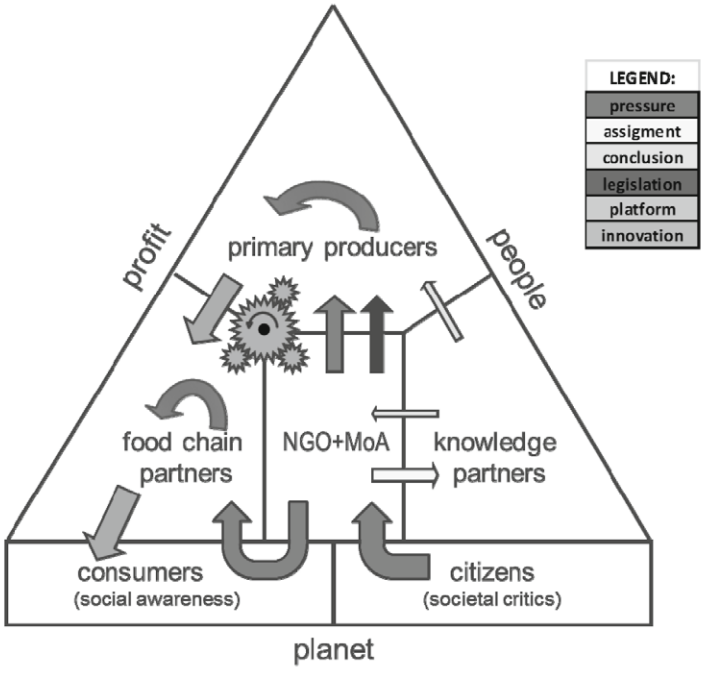

Figure 1. Conceptual framework of transitions in food chains.

The challenge for the two LEI researchers was to get the food chain dimension of sustainable crop protection, through the stakeholder process, on the agenda of the National Action Plan. In that context they pushed the development of an intermediate segment (between conventional and organic production) in the market for fruit, vegetable and arable products.

Data collection and analysis

Data collection for the analysis in this paper has been done through participatory action research (Pretty *et al.*, 1995). The first author of this paper has been one of the two LEI researchers participating in three of the five working groups of the National Action Plan:

- outdoor crops: member from LEI (researcher not involved in writing this paper);
- covered crops: member from LEI (first author of this paper);
- non-agriculture;
- strategy: editor from LEI (first author of this paper);
- biodiversity.

The first author of this paper was thus welcomed as editor of the (influential) working group 'Strategy'.

The two researchers compiled a folder of the mailing lists and the e-mail correspondence of the three working groups. Afterwards, they analysed these mailing lists (names and affiliations) and conducted a contents analysis of the e-mail correspondence. The people appearing in the mailing lists were, on the basis of their professional affiliations, classified in four stakeholder groups:

- Policy and Governance;
- Research and Development;
- Input supply and Production;
- Processing and Trade.

In the contents analysis we identified the concepts and controversies emerging in the working groups. We also identified the stakeholders proposing concepts and engaging in controversies. Finally, we monitored our own socio-technical actions in proposing concepts and establishing networks.

Stakeholders and issues

The National Action Plan for Sustainable Use of Pesticides (2013-2023) was initiated by the Ministry of Infrastructure and Environment and the Ministry of Economic Affairs, Agriculture and Innovation. They organized an advisory board of stakeholders. The stakeholders were invited to form working groups with the task to formulate targets and ambitions for the National Action Plan. The composition of the advisory board and three working groups is presented in Table 1.

The column 'advisory board' in Table 1 resembles the somewhat imbalanced composition of the multi-stakeholder agreement of the period 2000-2010. The composition of the working groups 'outdoor crops', 'covered crops' and 'strategy' seems to be more balanced in the first instance. However, the stakeholder group 'Processing and Trade' was also poorly represented in these working groups. Futhermore, agricultural economists were absent from the mailing list of the advisory board. They therefore bluntly invited themselves for the advisory board and the working groups.

During the discussions in the working groups the interests and ambitions of the various stakeholder groups became visible. The policymakers and specialists of the Ministry of Environment, the Ministry of Agriculture and the Association of Water Companies emphasised the national and European targets for water quality. The technical researchers advocated the further development and application of IPM

Table 1. Numbers of participants in advisory board and working groups of National Action Plan.

Stakeholder group	Advisory board	Outdoor crops	Covered crops	Strategy
Policy and Governance	20	5	6	3
Research and Development	9	4	4	5
Input supply and Production	17	10	7	6
Processing and Trade	3	1	2	1
Total	49	20	19	15

(integrated pest management), including precision techniques, resistant cultivars, agro-biodiversity, soil suppressiveness. The producers and distributors of chemical pesticides, joined by the national farmers' organisation, asked for a flexible authorisation process for pesticide applications in minor crops. The producers and distributors of biological control agents had a similar demand with respect to low risk pesticides and growth enhancers. The socio-economic researchers, trade partners and certification organisations flagged product quality, including low residue limits and return on investment. All stakeholder groups thus shared a tendency to emphasize their own priority interests and values, whilst ignoring the importance of balancing these interests and values with respect for the perhaps equally important interests and values of other stakeholder groups. The NAP process could thus have benefited from using an integrated ethical framework like the ethical matrix (Mepham *et al.,* 2006).

The discussions in the working groups thus revealed some ethical dilemmas. The policymakers and specialists of the Ministry of Agriculture were not too happy with the extra restrictions on pesticide residues, as demanded by the retailers. These restrictions force farmers to narrow the package of pesticides used and to intensify the use of the remaining pesticides, and consequently increase the environmental risks of the remaining pesticides. The involved specialists thus implicitly considered water quality to be a more important interest or value than food quality, and failed to see that addressing ethical dilemmas entails questioning how both values could be respected at the same time (Korthals, 2004). A similar dilemma was present in ornamental crops: crop protection specialists detest the zero-tolerance of retailers against insects in flowers and plants. According to these specialists it takes too much pesticides to remove the last insects from flowers and plants. Again they tried to trump product quality interests or values with environmental quality interests or values, without seriously looking for possibilities to simultaneously serve both interests, respect both values. The chemical industry did warn for a one-sided attention for pesticide use and risk reduction. They stated that market requirements, labour needs and energy needs should also be taken in consideration. The producers of biological control agents accused the crop protection specialists of using false arguments against the residue restrictions of the retailers. They explained that low residue levels are crucial for vegetable growers to improve their position in the market. These statements of the input suppliers reveal a latent controversy between planet thinking of the public sector and profit thinking of the private sector. The two researchers of LEI tried to bridge this controversy by gathering support for an intermediate (between conventional and organic production) segment in the market for food products.

Reflection

Figure 2 shows a summary of the interests and ambitions as mentioned in the previous section. The previous section showed how categories of stakeholders each pushed their own interests and ambitions. The water quality stakeholders aimed to achieve the targets of the Water Framework Directive (European Union, 2000) in time. The habitat quality stakeholders tried to safeguard food security by promoting soil quality and biodiversity. The product quality stakeholders aimed to create customer value by

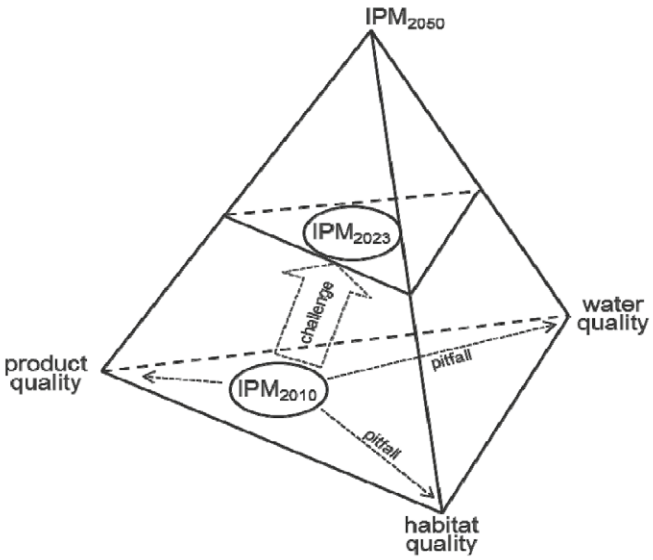

Figure 2. Interests and ambitions for National Action Plan on sustainable crop protection.

improving food quality and food safety. Suppliers of pesticides (chemical or biological) put much effort in designing low risk substances. Crop protection researchers put much effort in designing precision techniques or cropping systems that reduce the use and the dependency of pesticides. All these activities are useful and legitimate in theirselves. However, the pitfall is compartmentalisation with as consequence that stakeholders become each other's opponents instead of partners in a socio-ethical dialogue. This happened with respect to water quality and product quality. Likewise, precision techniques may lead away from the development of robust cropping systems. Hence, our call for application of an integrated ethical framework in processes like the development of a National Action Plan on sustainable crop protection to ensure that all relevant stakeholders have a voice and that all relevant values are voiced.

The challenge for the two LEI researchers was to get the food chain dimension of sustainable crop protection on the agenda of the National Action Plan. We pushed the development of sustainable cropping systems (IPM_{2023}), supported by an intermediate market segment, for that purpose. We thus tried to gather the congruent interests of various public and private stakeholders in one concept (IPM_{2023}). We succeeded in including the idea of an intermediate market segment in the reports of the three working groups of the National Action Plan. Through individual conversations we received support for the intermediate market segment from stakeholders within the Ministry of Environment, socio-technical research, National Farmers' Organisation, producers of biological control agents, and certification organisations.

An interesting socio-ethical question is the question of whether socio-economic researchers are professionally allowed to introduce their personal values and ambitions in a stakeholder process like the NAP process. The section on stakeholders and issues showed that the various stakeholder groups contributed ideas on the basis of their own ambitions and interests. In a participatory process, as described in this paper, it is good to have a vision on all dimensions of sustainable crop protection. Therefore, we would like to answer the question with a claim: it seems socio-ethically rather weird indeed to remain silent as socio-economic researchers when a willingness to make dirty hands could improve the process and its results (De Bakker, 2007).

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Section 10. Food in context

This is or is not food: framing malnutrition, obesity and healthy eating

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Abstract

A lot of ethical research on food and agriculture focuses on distribution, responsibilities, access and impacts that harm others. However not much reflective analysis is done with respect to ontological assumptions of food and food production which are world disclosing views. They are not only perceptions, but ways people act upon an event that is seen as food, built networks of food, solve problems and connect food with other events. Cases of framing comprise malnutrition, obesity and healthy eating. Strategies of supplementation and biofortification frame 'malnutrition as a health problem', and propose health strategies with drugs or crops with added on drugs or vitamins. Their solutions underestimate the agricultural complexity of malnutrition and deliver only temporary relief. Framing the problem as a agricultural problem would imply taking into account the reduction of micronutrients during the post-harvest phase. Secondly, ethics of obesity assumes the 'definition of obesity as the unbalance between energy input (food) and energy output'. This seemingly neutral definition is framed because many put emphasis on the first term, the input, and require people to eat sober and in particular to restrain oneself in the things one likes to eat. One should measure the things one is eating, weigh oneself every day and eat alone, not to be distracted by social gatherings. However, framing food as a pleasurable and social event, direct solutions of obesity to eating only the food one likes together with others. Finally, 'nutrigenomical healthy eating assumes that one shouldn't put trust in one's own body', but in biomarkers. Their quantitative outcomes are presented as moralizing directions what to eat. Healthy eating differently framed as a strategy of learning to trust one's body, and to understand the signals that it gives together with the collective responsibilities for a meal, is outframed by this assumption. These cases will serve as a basis for generalizations on the functions of ontological, world disclosing assumptions and their ethical analysis. Food is the famous elephant in the room and has all characteristics of a multi-complex wicked problem with multi-meaning frames. Frame analysis should therefore in explicating frames strive for a transparent cooperative deliberation between them.

Keywords: views on food, ethical frame analysis, controversies, power

Introduction

A lot of ethical research on food and agriculture focuses on rights, distribution, responsibilities, access and impacts that harm others. However, very often, in particular large scale and global food projects are developed on the basis of certain normative assumptions about what food is. Ethical research should therefore also focus on the issue 'what is food?' Analysis of this question results in different answers. Pollan (2009: 5) for example, argues that most stuff offered in supermarkets is not food at all; he calls it 'edible foodlike substances'. Many western food scientists consider insects and dogs not food, although non-western people enjoy them eating and the systematic production of dogs or insects could probably reduce the problem of hunger. A last example is the American battle in how far pizza is a vegetable (see: http://www.foodpolitics.com/2011/11/its-official-pizza-is-a-vegetable), making it again clear that the view on food is not an abstract definition issue, but also a power play that goes into the details. The answer to the question of what counts as food selects certain items and actions in the world, and excludes others; the answer discloses the world of food in a particular way and structures therefore normative ontological

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issues with wide reaching institutional and cultural implications. These ontological assumptions do not only regard perceptions, but ways people act upon an event that is seen as food, built networks of food, solve problems and connect food with other events in the world. There is not much reflective analysis on what counts as food associated with ontological assumptions of food and food production and their world disclosing impact. In this paper we will discuss several strategies that define food in a certain way and outline strategies to act accordingly which is called 'framing'. Our cases will be strategies to reduce malnutrition and obesity and a strategy to increase healthy eating.

Scripts, worldviews, and framing

According to Goffman (1974), frames are: 'schemata of interpretation' ('paradigms' in the words of Kuhn; 'vocabularies' according to Rorty) that allow individuals or groups 'to locate, perceive, identify, and label' events and occurrences, thus rendering meaning, organizing experiences, and guiding actions. There are many more similarities on the topic of frame between these authors and others, like for instance Dewey and Heidegger (Kompridis 1994). Frames determine what counts as x, so food frames determine what counts as food and what not. From a pragmatist point of view, Schon and Rein developed their frame analysis, which emphasizes the role of assumptions that make ethico- political controversies often so troublesome.

World disclosing frames are not contingent definitions. The ontological assumptions of frames are not only about perceptions, but also about the way people act upon an event that is seen as food, built networks around food and food production, and the way they connect food with other events. Food and food production have different meanings: food can for instance be seen and acted upon as a medicine, as fuel to fill your stomach, as consolation; food production also can be defined in different reality structuring way. Framing food determines firstly which persons or group of persons and items of stuff are seen as collaborators, stakeholders, responsible actors and users and which ones not; it also determines the way the actors perceive themselves and others, nature and animals. Secondly, it determines the practical options and strategies, and therefore also the consequences of a certain food script in connection with other issues, like that of livelihood, work, home, and political power. I will discuss three examples of framing of food with respect to malnutrition, healthy food and obesity, show some alternative normative-ontological perspective and then try to distill some lessons from this normative-ontological discussion.

A medical food view to reduce malnutrition: biofortification

Micronutrient malnutrition is a severe problem because more than half of the world's hungry people are hungry not due to lack of energy (calories and proteins) but due to lack of essentials minerals and vitamins resulting in severe diseases and malfunctioning. The history of preventing micronutrient deficiencies has no foreseeable end yet. International efforts to reduce these deficiencies started already in the seventies. In 1992, the International Conference for Nutrition and the World fit for children pledged: 'we pledge to make all efforts to eliminate before the end of this decade: (1) famine and famine-related deaths; (2) starvation and nutritional deficiency diseases in communities affected by natural and man-made disasters; and (3) iodine and vitamin A deficiencies.' (FAO, 1992: 5).

With respect to public health for both developed and the developing world international initiatives of supplementation and biofortification emerged tackling nutritional deficiencies that result in diseases. Supplementation mostly means providing of micronutrients to victims of malnutrition as supplements either in pill form or in form of cooking oil, sauces, or drinks. Four arguments are mostly given: it is cheap, it attacks the cause of the problem directly, it is easy to give and it has presumably huge effects (Johns *et al*., 2007). Another strategy is biofortification which means that nutrients are incorporated

in seeds of crops (Clugston and Smith, 2002). Currently, there are several large technologic networks that either sponsored by public organizations or by private funding agencies are active in the field of biofortification. They are mostly focusing on increasing the density of particular micronutrients in crops, to produce the effective reduction of malnutrition. Large programs are for instance a Challenge Program of the CGIAR Biofortification Millennium Program, called HarvestPlus; four programs of Grand Challenges in Global Health: one about modifying Sorghum (African Biofortified Sorghum Project, of African, American and Japanese institutions to enhance sorghum with iron, zinc and vitamin C), one about Rice, one about Banana and one about cassava (BioCassaveplus with nutritionally enhanced cassava (AU/NEPAD, 2006); BAGELS (Biofortification through Agronomy and Genotypes to Elevate the Levels of Selenium; UK-based); Protato, protein enriched potato, Govindarajan Padmanaban; and INSTAPA (Biofortified millet). An example is that almost one-third of the world's people don't get enough iodine from food and water. The result is dwarfism, cretinism and mental slowness. The suggestion is: put some iodine in water and food and the problem is solved.

The current strategies of supplementation and biofortification define the problem of malnutrition as a health problem, and use health strategies: they target one particular deficiency, e.g. iodine deficiency, propose a specific micronutrient and try to increase its presence in crops without looking for long term and wider effects like sustainability. One could mention this kind of solution a drug solution, like medical researchers are doing when a health problem is diagnosed: then the researchers focus on the medical problem and try to cure this. Although these strategies are already in use for more than thirty years and give relief during short periods of food shortages, they do not seem to provide sustainable solutions to micronutrient malnutrition and therefore the problem of malnutrition still persists. Recently, the number of malnutritioned people is even growing. According to Jean Ziegler (the United Nations Special Rapporteur on the Right to Food for 2000 to March 2008), 'In the world, approximately 62 millions people, all causes of death combined, die each year. More than half of them die of malnutrition. One in twelve people worldwide are malnourished'.

The two reasons behind these problems are firstly that the science and technology innovation trajectories to produce biofortified crops are formulated as end of pipe or top down solutions (IAASTD 2008). This end of pipe approach is confirmed, for instance, in the advice after the research to look for the production and consumption taken in the rather positive 'Report of the First External Review of the HarvestPlus Challenge Program' (2008): 'Whilst enhancement may be brought about through breeding research, in moving to deployment there will be a need to consider the whole chain from production to consumption as there are many steps at which the quality of foods can be affected either positively of negatively. '(p. vii; see also Brooks, 2008).

Secondly, the framing of the problem is one-sided and quite narrow. Malnutrition is a multi-faceted problem: physiological, agricultural, context dependent and cultural, and all these approaches should be taken together. The overall orientation of framing malnutrition as a health problem has several severe disadvantages that express themselves in the continuation of micronutrient malnutrition or transferring the problem. Because both strategies frame malnutrition in terms of health disentangled from food (production) they run the risk to underestimate the complexity of the problem of malnutrition. The issue is not an intentional or non-intentional mistake form the side of the scientists. The whole landscape of treatment of malnutrition is torn between the two large boxes that are used in classifying complex human body issues by national and international administrations: they are either health (belonging to World Health Organisation, WHO) or food problems (FAO). Mostly the health side has more power and wins, because it looks so much more urgent to care for health problems. Treatment of micronutrient malnutrition is therefore pulled toward the health pole.

A energetic food view on reducing obesity

Obesity attracts large attention everywhere. It is seen by many as an epidemic and attracts growing attention of governments, industry, public health organizations because of its very serious negative medical consequences. The WHO wrote a report in 2004 in which was stated that in 2020 50% of the world population could be overweight. The report signaled also the double burden of nutrition which means that populations are often simultaneously both underfed and overfed. Obesity is commonly measured in terms of the Body Mass Index (BMI), which means weight in kilograms per square of height in meters. In the US in some states 15-20% of the adults is obese and in some even more that 25% of the inhabitants (BMI >30). Many actors are involved and are held responsible and consequently, many blame each other.

Ethical analysis of obesity mostly concentrates on the issue of responsibility, who is to blame, and on the impact of food industry and the obesogenic environment in general. But no energy is put into an analysis of the ontological assumptions of the prominent strategy to reduce obesity. In fact, these assumptions do already play a role in the common sense definition of obesity, as the unbalance between energy input (food) and energy output. In the Netherlands for example, with its deeply rooted Calvinistic attitude towards life, the health authorities put heavy accent on the first term, the input, and requires people to restrain in eating, to eat sober and in particular to restrain oneself in the things one likes to eat. Women should not eat more than 2,000 calories a day and man not more than 2,500. One should measure and calculate the things one is eating and weigh oneself every day. When one eats too much during one day, one should eat less the next day. People are assumed to eat alone, and not to be distracted by social gatherings and habits. According to the Dutch Council of Healthcare and Care individual responsibility is the most important perspective in tackling life style diseases like obesity. The Dutch policy in line with its neoliberal policy not to disturb the power of large food market players, is much more concentrating on the output side of the issue: how to get more Dutch people walking, moving in daily life, and not on the input side, the energy-intake. You could call this treatment a quantitative and individualistic approach.

In other cultures, like the Italian, one starts with the second term, the output, and emphasizes to exercise daily; moreover, connecting this with the first term, attention is paid to getting good food ingredients and doing the cooking. In Italy with its strong feeling for Italian food as the only good food, the problem is seen as a food problem. Importantly, the emphasis on food is in Italy not done from a moralizing point of view, but from a gastronomical or gustatory point of view: the body is seen as a source of eating pleasure. In the Netherlands the body is seen as to be monitored and controlled (Korthals, 2011).

A nutrigenomics view on food and healthy eating

Nutrigenomics is the molecular based science on the interaction between genes and diet. There are different branches of nutrigenomics, but the science oriented towards personalized nutrition is quite dominant in getting grants. On the basis of an intensive content analysis of prominent texts on nutrigenomics, Komduur, Korthals and Te Molder came to the conclusion that in nutrigenomics, as personalized nutrition, first, food was exclusively interpreted in terms of disease prevention. Therefore, health was seen as a state that preceded a sum of possible diseases, and food had an intervening role in delaying these possible diseases. Second, it was assumed that health should be explained as a calculable interaction between food and genes. Health is minimized to quantifiable health risks and disease prevention through food-gene interactions by the right food choice. The third assumption is that disease prevention by minimization of risks through the right food choice is in the hands of the individual; via this individual responsibility through finding out personal risks, revealed through personal tests, or belonging to a risk group, the individual has to act and spend time to make a good food choice. The individual has to play a large role in disease prevention by minimizing personal risks through tests or

belonging to a risk group and eating the right foods. Together, these 3 concepts suggest that the meaning of life is interpreted as a healthy life, in which risks should be preventively calculated and balanced and in which the individual should have the prime responsibility to act in accordance to the outcomes of tests by selecting the right type of food. Persons who do not accept this task do not act responsibly.

One of the implications of these assumptions of nutrigenomics is that you shouldn't trust your own body, because biomarkers through testing know better about the state of health of the body. The quantitative risks simultaneously present themselves as moralizing directions to stop eating certain type of foods and to eat others more. One could call this a strategy of fear and guilt, because most people are encouraged to eat this way out of fear for worse things to happen; guilt because most people will not live up to the directions that are given by the numbers that are provided by a test.

There is a different strategy to find one's way in the jungle of food information and implicit prescriptions, and one could call this a strategy of pleasure and sociality because it starts with the idea that taste gives you a satisfaction, gives satiety and then stops your appetite. In this strategy you have to learn to listen to your body, not only to outside measure instruments and to participate in good meals with friends full of conversation and hospitality. Learning to trust your body, and to understand the signals that it gives together with the collective responsibilities for a meal, allows for a balance between flexibility and variation. Good taste during a good common meal can satisfy your body; but one has to find out what precisely one's body likes and doesn't like. This searching process could aim at fine tuning the senses to sensors of your appetite that can tell you this is okay, you have eaten enough. Moreover, in preparing the meal and being exposed to slowly developing smells, one already anticipates on this.

Discussion

These cases of framing are a basis for some generalizations on the status and function of ontological, world disclosing assumptions with respect to food and food production. The landscape of food is occupied with numerous wicked problems and differing interpretations, institutional networks and attitudes. New ontological assumptions implicitly creep into institutional ones outframing others, which is not an intentional or non-intentional mistake form the side of the framer. First, codifications of scripts of societal agencies, of scientists, of disciplines, of industrialists and other entrepreneurs align with existing framing food related issues, like health and industry, which we discussed in the treatment of malnutrition. Secondly, food and food production due to their complexity and multifunctionality (Korthals, 2004) does not fit very well in scientific discourses because common scientific practices are often directed to simplicity and analyticity. Food is the famous elephant in the room. Thirdly, although global definitions seem to express a consensus, it is inevitable that these abstract definitions in innovation projects are explained in a concrete jargon, which means that a new layer of framing is applied.

Conclusion

We discussed several strategies that define food in a certain way and outline strategies to act accordingly. Strategies of supplementation and biofortification frame *malnutrition* as a health problem, and propose health strategies with drugs or crops with added on drugs or vitamins. Their solutions underestimate the agricultural complexity of malnutrition and deliver only temporary relief. Framing the problem as a agricultural problem would imply taking into account the reduction of micronutrients during the post-harvest phase. Secondly, *obesity's* seemingly neutral definition is framed because many put emphasis on the first term, the input, and require people to eat sober and in particular to restrain oneself in the things one likes to eat. However, framing food as a pleasurable and social event, direct solutions of obesity to eating only the food one likes together with others. Finally, *nutrigenomical healthy eating* assumes that one shouldn't put trust in one's own body, but in biomarkers. Their quantitative outcomes are presented

as moralizing directions what to eat. Healthy eating differently framed as a strategy of learning to trust one's body, and to understand the signals that it gives together with the collective responsibilities for a meal, is outframed by this assumption. Ontological assumptions often outframe others less dominant, and that make many debates about food so disappointing, because participants do not realize that the hidden ontological assumptions steer the discussion in a certain direction. Analysing food as a framing issue should comprise from the beginning the full complexity of the mosaic of social and ethical values that express themselves in dilemmas between (sustainable) agriculture, biodiversity, climate-neutral emissions, and cultural preferences of food and perceptions of risks, implying bringing in silenced poor people's voices. Framing food blurs the fundamental distinction of academic ethics between rights and justice versus the good life, and gives therefore ample motivation to reframe this distinction as well.

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Food as art: *poiēsis* and the importance of soft impacts

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Abstract

Working towards a general philosophy of food production, this paper discusses food production as a dialectic between technology and art, understood within a loose Heideggerian framework. Technology in this context means the scalable and efficient production of a commodity, while art means the production of meaning and the unveiling of a world. Focusing our understanding of food production under the rubric of '*poiēsis*' (or art) gives us a framework for understanding food and food technology within which the goodness of food and its production can be assessed in terms of its fittingness (*convenientia*) instead of its efficiency (mere convenience) alone. For, considering food as art, we are not exclusively concerned with its technological production, but with its creation and meaning. But no given thing can mean everything; every given thing limits the possible meanings that can be projected upon it. Thus not everything is fitting despite its technological possibility. We ought to seek fittingness, which is uncovered in such soft impacts as those of lifestyle, culture, religion, aesthetics, and human dignity, and summed up in the notion of food as an art disclosing these and unveiling a world.

Keywords: convenience, fittingness, Martin Heidegger, food preference, technology, craft

Introduction: hard versus soft impacts

When we talk about food production and security, we are really talking about a large and complicated puzzle. In choosing to highlight soft impacts, I am admittedly only dealing with a small piece, but it must be situated within the whole. Soft impacts – those impacts that resist measurement – are important within a discussion of the philosophy of food production because when food becomes a merely technical or technological issue then hard impacts tend to obscure the non-technological. These don't blind us to the issues to which technology gives rise; indeed, we have become obsessed with them, counting food miles, reusing bags, and buying local. Yet, the danger remains that we see the world only in terms of hard impacts, leading in turn to a bad infinity of technological solutions, each with their own hard impacts requiring solutions. And yet it is the soft impacts that indicate how fitting food is for a person, rather than how available or convenient. The soft impacts indicate what food *means*.

Indeed, the hallmark of our age is to think that food production and security are merely technical issues – issues to be solved through a marriage of technology, economics, and policy. We need look no further than the FAO's definition of food security: 'when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life' (FAO, 2008). The FAO quickly interprets the definition in a purely technological manner, identifying 'the four main dimensions of food security':

1. physical availability of food: level of food production, food stocks levels, and net trade;
2. economic and physical access to food: policy focus on income, expenditure and markets;
3. food utilization: safety and diversity of food – the nutritional status of individuals;
4. stability of the other three dimensions over time (FAO, 2008).

As a good Aristotelian concerned with a well-functioning polity (or world community, as the case may be), I agree that these dimensions are indeed both essential and necessary; stability is but a dream without healthy and reasonably-fed individuals. However necessary these dimensions may be, I would also argue

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that they are not sufficient, which even the FAO's own definition of food security itself fleetingly points out. For, missing from the list of dimensions is any mention of the definition's 'food preferences,' which I take not to be a non-technological soft impact. These four dimensions are presented solely as hard impacts – questions of production and distribution answerable through technological and economic fixes arranged through political will. The venture capitalist Vinod Khosla calls such solutions 'black swan' ideas, which he takes to be elusive, achievable, and – most importantly – highly profitable technologies capable of delivering us from disaster (Economist, 2011). In short, Kholsa and the FAO are not alone in holding that the dimensions remain technocratic – technical solutions to technical problems. And in this sense food becomes nothing more than 'edible technology' (David M. Kaplan, unpublished paper).

How are we to understand soft impacts? Let me quote the Dutch philosopher D. Swierstra at length: 'The hard impacts of techniques *techniek* are certainly important. But our everyday life is not usually determined by exploding, poisonous, or world-conquering technology *technologie*. Instead, it is determined by techniques that in a scarcely visible way give form to the way we act, to our relations, to our norms, values, rights, duties, expectations, and desires. Think about how the pill has changed our sexual relations, how the computer has changed work, how the mobile telephone has changed social relations. These sorts of consequences of technology I call soft impacts.' (Swierstra, 2011: 5). Soft impacts are the effects that technology has upon the way we view the world, and thus ultimately soft impacts are the effects technology has upon culture or society. And this is important because, as Bradley points out, culture is the framework of all our experience (Bradley, 1876: 150).

Food preference is but one example of a soft impact. Yet, it is very important; as Pollan points out, the last bastion of an immigrant's cultural assimilation is the pantry (Pollan, 2007: 1). And there is one image of food preference I cannot shake: today a malnourished Somali child in Dabaab, Kenya, will line up to eat a bowl of porridge or rice made possible by the Green Revolution. What does this situation owe to our own preferences for cheap, resource-hungry, highly processed food? Does our petroleum-soaked framework of technique-induced convenience play some role in this misery? After all, consumers in Europe and North America waste an estimated 95-115 kg/year per capita, compared to 6-11 kg/year in Sub-Saharan Africa and South/Southeast Asia (Gustavsson *et al*., 2011). When we think about such a situation outside of its hard impacts (calorie and carbohydrate count, number of lives saved, etc.), such soft impacts can track, or perhaps illustrate, the way we experience and understand the world. These impacts are part of the way a world is uncovered, or made explicit, as Martin Heidegger would say (although the language of impacts is not his). And this is why a discussion of Heidegger is appropriate in this forum: Heidegger gives us a cogent view of the essence of technology without focusing on techniques themselves.

Martin Heidegger and *poiēsis*

Now, I grant that Heidegger was not overly interested in culture or society. And in a sense, Heidegger is the last person one would normally want to drag into a conversation about food. Alexandre Koyré was the first to note that Dasein (which, to oversimplify, is Heidegger's characteristic name for the human being) does not eat: '*M. Heidegger semble vouloir éviter le biologisme à tout prix: son Dasein parle et agit, en revanche il ne mange pas*' (Koyré, 1981: 229). Koyré holds that Heidegger, in his attempt to develop his fundamental ontology, strove to leave any biological determinations behind. Fernando Belo draws a telling lesson here: '*Le Dasein ne mange pas, c'est le propre des animaux, sans doute. En pourtant, là n'est pas la racine de tout souci*?' (Belo, 2007: 462). In excluding eating, Heidegger paradoxically removes the ground of care [*Sorge*] that *Being and Time* took as its centerpiece. Moreover, that great critic of Heidegger, Emmanuel Levinas, instituted the concept of *jouissance*, construed precisely as the enjoyment of food and drink, because he understood that the subject needs to be satiated in order to be ethically responsible (Levinas, 1991:136), a lesson Aristotle taught over 2000 years earlier.

Moreover, there is the little matter of Heidegger's controversial foray into our current topic in his Bremen lectures of 1949 on technology: 'Agriculture is now a motorized food industry, the same thing in its essence as the production of corpses in the gas chambers and the extermination camps, the same thing as blockades and the reduction of countries to famine, the same thing as the manufacture of hydrogen bombs' (Safranski, 1998: 414). Not surprisingly, these words have led to a whole spectrum of response, from outright condemnation to abject apologies. Leaving aside the extremes, Safranski argues that Heidegger saw Auschwitz as the culmination of 20th century technology; Lacoue-Labarthe agrees with Safranski that Heidegger is aghast that such a crime has become mechanized, but argues that his words are 'scandalously insufficient' (Lyotard, 1990 85). Unsurprisingly, Heidegger's enemies have seized on them to hound him for his political decisions in the mid 1930s, and his now infamous post-war anti-Humanistic stance. After all, this is a man who once praised the Nazi Party for its 'inner truth and greatness' *precisely* because he saw it as the answer to 'the encounter of global technology and modern humanity' (Heidegger, 2000: 213).

So, it is with some trepidation that I bring Heidegger up. The typical view of Heidegger's critique of technology says that technology has become autonomous and therefore threatening since it dictates human actions, instead of the other way around, a process that 'has gone beyond any possible repeal' (Winner, 1989: 14). David M. Kaplan notes that 'this critique of technology was crystallized in the 1940s and 1960s, in the aftermath of the Holocaust and the atomic bomb' (Kaplan, 2011: 227) and numbers Jacques Ellul, Herbert Marcuse, and Jaspers along with Heidegger. In sum, technology is an out-of-control, anti-human force threatening society as we know it, and its genesis is located in the fear of what Ernst Jünger called 'total mobilization,' i.e. the complete array of politics, economy, and industry into a national war effort (Jünger, 1993). In isolation, many of Heidegger's comments on technology do bear this interpretation, especially those found in his famous interview with *Der Spiegel*, which is tellingly, and almost pathetically, entitled 'Only a God Can Save Us.' Such a dire view of technology, and of food technology, is rightly excoriated. If it were truly representational of the thoughts of Ellul, Marcuse, Jaspers, and Heidegger (*inter alia*), then these seminal minds would be but Luddites or mid-20th century non-confessional Mennonites.

Nevertheless, these are all subtle thinkers, and I maintain that Heidegger's views on technology remain instructive when restricted to the area of metaphysics. I am thinking of his view of technology as essentially revealing – for him, technology reveals or unveils or presents some reality in its own characteristic manner. When we strip away all the possible luddite interpretations of his critique of technology, Heidegger in essence argues that technology has evolved from simple unveiling akin to art to a new kind of concealment that hides its original essence and instead reduces artifacts to *partes extra partes* composed though omnipotent efficient causality. This is what Heidegger calls the 'enframing,' which he takes to be the essence of technology in which 'the actual everywhere, more or less, becomes standing-reserve' (Heidegger, 1993: 329). The enframing is simply the framework in which technology currently operates, reducing everything to resources to be used efficiently, and more importantly, blinding us to any other way of seeing the world. This is a metaphysical claim – a claim arguing for a certain structuring of reality (to put it crudely). In this view, the technological artifact is merely the composite of ready-to-hand reserves. When we talk about food as a commodity, then we are talking about food in this way. This type of talk – the commoditization of food – inscribes food within the ambit of efficiency understood as convenience, and far removes it from any idea of what Thomas Aquinas called *conveniens*, or fittingness.

For Heidegger, in its origin as unveiling, technology is connected with *poiēsis* – making, crafting: 'there was a time when the bringing forth of the true into the beautiful was called *technē*. The *poiēsis* of the fine arts was also called *technē*' (Heidegger, 1993: 339). In this sense, as Heidegger says, technology is indistinguishable from art and artisanship – artisans bring forth meaningful artifacts. Heidegger is

thus arguing that technology is essentially nothing technological, understood as a complex of efficient techniques, but is instead essentially connected with the human as the being p

Food as *poiēsis*

Since technology can be seen as creative and purrojecting meaning in creative acts. Only when technology becomes conceived as technological – only when the enframing overtakes the disclosing capacity of *poiēsis*, does it begin to conceal. And this is precisely why we refer to – and often prefer – products such as 'craft beer' or 'artisanal cheese'; there is something beyond technique here.posive, I'll gladly go along with considering food as *technē*, but *technē* understood as *poiēsis*, as a creative projection. Aristotle too saw *poiēsis* as goal-direct creation, in the sense of a shipbuilder crafting something that will float for some purpose standing outside of the technology used to create it; the technique is subordinate to an external end. Food fits this paradigm; it, as food, needs to escape the technique. Food is a meaningful artifact. Food structures our existence. Food is a mix of nature and craft that as a result is fitting for a person, a fittingness we can measure in the health of both the individual and the culture. Food is thus not *essentially* technological and *possibly* artistic, but is fundamentally poetic. Understanding food as a *poiēsis* – an uncovering of a world – clearly brings into relief a meaning of the food apart from the technique. Food is not just or even primarily edible technology.

Food as technology assigns no meaning to food beyond technology. But it is precisely the other senses of food that contemporary food producers often dismiss which provide such content: religious, nutrition, communal, comfort, etc. If the meaning of food is technology, then technology truly threatens to become the autonomous pursuit of efficient causality, which would require humans to adapt to it. And in countries adopting the convenient North American diet of convenience food, we are seeing specific results: an epidemic of obesity, diabetes, heart disease, (Popkin, 2001; Popkin and Doak, 1998), and escalating health costs (Withrow and Alter, 2011), all greatly enhanced by the mountain of Heidegger's ready-to-hand reserves, which in turn are made possible by the technologization of food. Lacking the check that religion, tradition, and society bring to food, our comportment to it becomes significantly altered. Is it mere coincidence that America even has a profession competitive eating league – Major League Eating?

Let me put this otherwise. The other senses of food say 'why' about food; technology just says 'how' or 'what.' And of course, if 'how' is the only or most important issue about food, then philosophy will always be secondary or soft, but only in a pejorative sense. Thus, it would be hard to discuss technology without moralizing. So food would remain simply edible technology: the process identical to the result. 'Why,' meaning, always points beyond. 'What,' or how, is always imminent. And since we start with 'how' and end with technology, I do not feel any closer to having grasped the proper nature of food. The car is no different from the bagel, with the caveat that I not eat the car. But no given thing can mean everything; every given thing limits the possible meanings that can be projected upon it. Despite technology, not everything edible is food. Thus not everything is fitting even if it is technologically possible. Food demands fittingness, *conveniens,* which we tacitly understand whenever we associate certain foods with certain activities, holidays, or even health.

Families gather in order to feast. Religious traditions have always incorporated food. We call friends com***pan***ions (bread: *panis*). All these things project far beyond technology. For food sustains us – whether spiritually, somatically, communally, or at the hearth (I do not come close to exhausting the meanings here). True sustenance is sustenance precisely insofar as it institutes a difference, which is to say a meaning. For: although humans need food, we don't feed. At our best, we dine; normally, we just eat. But both of these are differences. Dining is a feast – a sacred event, cut off from the normal order as the *templum* is from the *saeculum* – to borrow from Heidegger's analysis of religious versus secular

architecture. And simple eating is always inscribed within some system of meaning which removes eating from mere feeding. What, when, how, and with whom we eat is always significant – because these indicate *why* we eat. Eating food, which is meaningful, is not feeding, which is not meaningful. Calling food edible technology does not capture this.

In short, I fail to see how, if food is simply edible technology, we avoid construing ourselves exclusively as *homo mechanicus*, or simply as machines (as Descartes sometimes seemed to think). After all, as Feuerbach famously quipped, *der Mensch ist was er isst* (Feuerbach, 1990: 27). Thus, beyond just *structuring* our existence, food *is* our existence. Food is different from a technological product because we literally *become* what we eat. And since it is what we become, or what we *fear* we will become, we develop cultural, religious, and personal food taboos. These can only make sense if we implicitly understand food as *poiēsis*, because the creative crafting of food is also the creative crafting of the human person. Food as *poiēsis* then permits us insights into *homo sacer*, or simply *homo communalis* (the *zōon politikon* of Aristotle), without denying our uniqueness as *homo faber*.

For, when something is simply considered as a product, it is only considered in its composition, something merely put together. It is a sum of its parts, which is the essence of technology and substitutability. This is how food scientists can put together a meal, largely comprising corn and soya extracts, that looks like 'real food,' and can even include actual nutrients through technological tinkering. This is how McDonalds can create the 'McRib' sandwich imitating a rack of ribs, whose 'bones' are in fact edible. Thoroughly fungible commodities are in turn composed of more and more highly processed fungible commodities, with each process adding to the profitability of the commodity.

Such technological food summons up images of *res extensa* being marshaled in the most efficient and profitable manner, giving us the illusion that we are in control of food. In his essay 'Ornament und Verbrechung,' Adolf Loos at the beginning of the 20th century praised this mass production precisely as the technological liberation from craft, on the grounds that craft focuses on ornamentation and wastes both natural and human resources (Loos, 1931: 83). Such decrying of craft sounds strange now. Again – think of craft beer and artisanal cheese: the very technology that goes into making these is not concerned alone with the efficiencies and scales that technology per se offers, but emphasizes product quality in place of quantity, and craftsmanship in place of mass production. Think about the glories of unpasteurized cheese – dangerous, an omnivore's dilemma, but trusted by many cultures in the hands of the master craftsman. Would Kraft make unpasteurized cheese?

We don't describe a painting as merely put together. Although no one would deny technique in a painting, few would reduce the painting to such – despite Warhol and his factory. We describe it as a whole, or we describe what its parts say about the whole. Our concern is not with its technological production (the making of the paints, the brushes, the stretching of the canvas, the building of the frame, etc.), but its creation: which is to say: what does it *mean*? And if it is a painstakingly clever counterfeit, once we realize this, we reject it, or simply admire in the technical skill of the counterfeiter. How would something more important like food be any different? Food like a real painting is a whole, related to our health, which is never merely somatic. Food as art or *poiēsis* brings us back to a human scale, obviating or at least themetizing the dehumanizing aspects of technology (speed, efficiency, soullessness) and emphasizing the fitting aspects of human technical creativity (ingeniousness, aesthetics, meaning). And importantly, food as *poiēsis* gets around a lacuna in technology, which does not capture that link between life and death, food and health, being and nothingness that is at the heart of food. The farmer, the chef, the butcher, and the mindful eater are all aware of their responsibility in the face of food, their connection with life and death. Expiation and ritual have long surrounded food, from slaughter to grace. Pagan priests used to butcher animals, just as various religious traditions to this day demand a religious authority at slaughter.

What I am saying is that technology only describes the 'what' of food as a 'how.' Not until we understand the 'why' of food can philosophy begin to address the hard and soft impacts. And then perhaps we might recognize that soft impacts are of equal importance as hard impacts. To see food only as an efficient product is to remain within the framework that encourages convenience food and paradoxically waste – and then to claim that technology is needed to solve world hunger. Perhaps if we did not see the continuum from the field to the plate as one of technical processing alone, but rather as processing befitting meaningfulness, then efficiency could become an issue itself. This would give us a better platform for philosophically viewing hard impacts, avoiding the easy answer of technological tinkering, which itself simply introduces another chain of technological considerations, hard impacts with a further knock-on effect upon human life. And this implies that the philosophical problems of food go well beyond what the FAO may see as the technical-political matter of food. Food may require technological processing, but it must be fitting, above all.

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Conflicting food production values: global free market or local production?

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Abstract

Global free markets are assumed to be of important long term benefit for poor countries. This is especially important for agriculture, as most poor countries have few other income alternatives. The main obstacle to a free market is trade-distorting measures in developing and developed countries, such as taxes, subsidies of production and export. This poses a challenge for global justice, if we accept that justice is a basic moral principle regulating relations between people belonging to same social institution, and that the economic world order should be regarded as such an institution. There are, however, moral and political reasons for retaining protection of national agriculture. Removing trade-distorting measures may lead to increased long transport of food, contributing to global warming due to CO_2-release, and increased intensive agriculture in vulnerable areas which are even more exposed due to climate change. Free markets may undermine future national self-sufficiency as farm lands and farming competence deteriorate due to competition from cheap imports. In addition, increased industrialisation leads to pressure on small farms and rural life worldwide, altering ownership structure and increased global warming. Finally, protecting national farming has cultural significance. Food production and processing is crucial part of identity, signifying belonging in particular communities, and is essential for protecting cultural landscapes. Thus, there is a conflict between the duty to promote global justice and the duty to protect domestic agriculture in order to preserve cultural values, environment and self-sufficiency. I will argue that we should remove trade-distorting taxes and subsidies and instead support farmers for their work. In this way we can fulfil the duty of justice without sacrificing self-sufficiency and the cultural values of farming. The environmental challenges of a global free market still must be resolved.

Keywords: global justice, food ethics, cultural values, trade regulation

Introduction

Food production is a basic condition for any human life in a densely populated world. Acquiring food has obviously always been a fundamental part of the human condition. Throughout history humans have eaten food that they or someone they know personally have produced and processed. Due to this, food plays an essential cultural role, and has become part of the cultural heritage that contributes to the identity of people as belonging to specific communities with shared cultural values. Food plays a significant role in the way we understand ourselves as belonging to or coming from a particular place. Thus, food is of value for our self-understanding, socially, cultural and geographically and for how we present ourselves to others.

In modern technology-dominated societies we witness an increased distance between food production and consumption. We no longer produce our own food, we do not know those who have produced it, and the food we consume often comes from some other part of the world, almost without seasonal variation. Food is increasingly produced under industrialised conditions, and comes to the consumer as processed food. This loss of contact with the basic ways of acquiring or producing food may result in alienation from a basic element of human life.

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The increased distance from food producers and production also affects food security. Instead of local, practice-based knowledge we get regulation and control systems, emphasising our role as costumers rather than responsible partners in food production. As consumers we raise a number of partly inconsistent demands concerning the food, which may result in food policies that contradict each other. We demand that it is as cheap as possible, but also that it must be safe to eat, healthy and tasty with a good appearance. In addition there is an increasing awareness of the political and ethical aspects of food production, as well as other value issues. This means that many require 'natural' food that is environmentally sound as well as morally sound, 'just' food.

In the following I will discuss the normative implications of the global food trade in light of these values. There appears to be a conflict between justice in international food trade on one hand, and a series of other moral concerns on the other. These include environmental concerns, the rights to self-sufficiency, as well as protection of food as a cultural value, important for human self-understanding.

Global food markets and global justice

Food markets are increasingly globalised. Basic food stuffs such as grain, vegetables, meat, oils and cheese are produced under industrialised conditions and transported across the world. Niche products such as high quality and regional speciality oils and cheese, cured ham and fish products are likewise sold throughout the world in smaller quantities, but at much higher prices.

Global free market is assumed to be of important long term benefit for poor countries, a reasonable assumption given that poor countries are highly competitive in wages and services. This presupposes that there are sufficient resources to preserve and transport the products – and that the trade actually is free enabling poor countries to exploit their competitive advantage. Most poor countries have few income alternatives, and agriculture is one of the areas where they already possess knowledge and the necessary resources for exporting goods. A common claim is that the main obstacles to poor countries using this opportunity for increased income are trade-distortions in developing and developed countries such as taxes on imported goods and subsidies of production and export of own farm products. So even if poor countries can deliver goods that are competitive in a free market, this opportunity is not open to them. The global market is not free.

This situation displays its problematic character at a moral level. The poorest are in a situation where they are arguably prevented from improving their own living conditions by regulations that are meant to protect those that already have more than sufficient income. Removing trade distorting measures would not, on this account, put the developed countries at risk of becoming poor. They only risk reduced growth of welfare. It is reasonable to discuss whether this is a just arrangement of international agricultural trade. Justice is understood as a basic moral principle regulating relations between people belonging to same social institution. Traditionally, justice has been restricted to states in the sense that only people belonging to the same state can raise justice claims against one another. In an increasingly globalised economic world order, we can say that we all belong to the same institutions, and if we accept that, justice becomes a global moral issue. Human rights have taken a central role in our understanding of ethics in the modern world, and Thomas Pogge (2008: 25) suggests that 'any institutional design is unjust if it foreseeably produces massive avoidable human-rights deficits.' As the opportunity to support oneself through participating in fair trade on equal terms can be considered a fundamental human right, the global agricultural trade system does contribute to large-scale avoidable human right deficits. It is avoidable, as alternative ways of organising global food trade is possible. This means that reforming the global food trade system is a moral duty for those who are in power to do so.

The obvious solution to global injustice in food trade would simply be to remove all trade distortions. The Australian Trade Minister Craig Emerson has suggested that by liberalising trade 'the market can seek out the best places on Earth to produce the food, produce it in quantities that are demanded, which satisfies both the physical demand for food and helps with reducing prices' (Anonymous, 2011: 7). The market would not only seek out 'the best places' to produce the food understood as the best soil and access to water, but best in the sense of providing cheap labour and low production costs and easy access to major markets. This would give poor countries an advantage. In addition, poor countries should be exempt from the rules against trade distortion in order to strengthen their competitive edge further. It is documented that several countries that have been able to escape poverty has done that by combining investments with government interventions, including trade protection. Allowing this asymmetrical trade system is arguably just in light of the poor countries' many years of disadvantage in the global food markets. In this way they are free to utilise global market freedom while protecting domestic production, until they have achieved a reasonable level of national income. At this point they must follow the same trade rules as developed countries.

The thesis that global free market is beneficial for the poorest is controversial. It is often the case that poor countries have low wages, taxes and other costs, as well as less regulation on pollution and protection of workers, making these countries attractive for establishing production. But these advantages for international corporations and finances are often combined with important disadvantages that may prevent investments, such as poorer infrastructure, lack of competence, corruption and unstable political situations. In addition, it is usually assumed that unregulated markets benefit the wealthy. They have the resources to compete even if their products are more expensive in production. Wealthy corporations can use their capital to sell at a loss for a certain period and they can use their resources to achieve competitive advantages through other measures than quality and price, such as advertisement and product placement. Especially in complex situations, having resources to spend will give a clear competitive advantage. In addition, the countries that have escaped poverty have mainly done it through industrialisation combined with improved education systems, not by increasing agricultural exports. Therefore it is reasonable to ask whether the free trade in agricultural products actually will help to improve the prospects of the poorest and by that advance global justice. Still, I assume that it is more likely that free trade will be more just (in the sense stated by Pogge) than the current system, and will take this as point of departure. In this context, the relevant policy forum for free trade in agriculture is the World Trade Organization (WTO).

WTO and Norwegian agriculture

The goal of the WTO agreement and negotiations on agriculture is reduction of trade-distorting measures such as taxation and domestic support measures (Orden *et al*., 2011). For most countries this is a threat to farmers, fishermen and rural life in general, and these interest groups tend to have significant political impact. Although paying lip service to the WTO goal, most countries instead try to change the structure of support and delay implementation (*ibid*.) This is fairly easy, as the complexities of the regulation give ample opportunities for covering up trade-distortions. But the picture is not altogether bleak, as the WTO negotiations seem to have growing impact: '[C]onsideration of WTO rules has entered increasingly into domestic debate on agricultural policies. The WTO regime is strong enough that countries have sought to avoid enacting legislation that would flagrantly violate their commitments.' (*ibid*. 5)

One of the countries that is often taken as an example in studies of protection of domestic agriculture is Norway. 'Norwegian agriculture is among the most heavily protected in the world. ... Norway has a complex system of farm subsidies involving deficiency payment, structural income support, acreage and headage payments, and a range of indirect supports. The system is buttressed by substantial import

protection, which limits market access.' (Blandford *et al*., 2010: 1479) According to the Doha Round agreement, Norway and other rich countries would be obliged to substantial reductions in support and protection. As we have seen, this represents a significant cost for a number of these countries. They prepare by redefining and reclassifying support e.g. as environment protection (*ibid*. 1477 f). This does not sound promising as a contribution to a more just international system of agricultural, but Norway is at least relatively transparent about agricultural support and protection as compared to most other rich countries.

Norway is a particularly interesting case when discussing global justice and WTO regulations on trade distortions for several reasons, including the country's heavy protection of agriculture. The country certainly has marginal significance in the global context as producer, as it is a mountainous country with relatively little arable land, and as market, with barely five million inhabitants. Still, it is one of the richest countries in the world and can afford to comply with WTO regulations. It has held a high profile in international debates for several decades as vocal supporter of an altered economic world order and is among the largest contributors to development aid when measured in percentage of GNP. Another interesting feature of Norwegian agricultural policy that it shares with many European countries is a strong domestic emphasis on the environmental, social and cultural significance of farming. This gives extra motivation for retaining the protective measures.

Given that global free market is required by justice, how can rich countries' subsidies and taxes be justified? It is not sufficient – morally speaking – to refer to the actions of others and say that they must protect their domestic production since everybody else in the same situation does it. As Peter Singer (1972: 232-3) points out this fact increases rather than diminishes the responsibility a rich country has to act morally right. Their authorities cannot point to the fact that farmers lose their income, either, as their loss can be replaced by other sources, given the economic situation of the country. Nor will it do to say that equal moral considerations are in conflict here so that the fundamental human rights of rich country farmers will be affected in a similar way to that of poor farmers in developing countries. As long as these farmers have income alternatives, their plight is not comparable. There exists no human right to continuing a particular way of life or earn your income in a particular way. The essential issue is that these farmers have income alternatives. Neither will for example Norway as a country suffer unduly, as agriculture is insignificant in the national economy (1% of GNP). One can certainly argue that justice is basically a domestic matter and only derivatively a global matter (Rawls, 1999: 105-120), and therefore our duties towards poor people in other countries are limited. But given that we accept that a set of global institutions is developing, this distinction is increasingly losing power.

Other moral concerns

Although we are morally obliged to remove trade distorting taxes and subsidies as a matter of justice, we may point to other moral concerns that are reasons for modifying this demand. The first is connected to environmental issues. The global food trade is morally problematic and further removing trade barriers will dramatically increase this problem. Long transport increases pollution and results in unnecessary high carbon release, contributing to climate change. This will probably most harmful to sub-tropical and tropical areas, where most of the poor people of the world live. We should aim for local production of all necessary food stuffs in order to reduce environmental costs due to long-distance transportation. In addition, it is likely that increased global trade based on more profitable agriculture in poor countries will accelerate industrialisation of agriculture in vulnerable areas, such as intentional destruction of tropical and subtropical rain forests, also a factor in climate change. A related area of concern is that increased industrialisation will lead to pressure on small farms and rural life worldwide, altering ownership structure. As long as there are no income alternatives, the least well off will not be helped by increased

domestic farm income if that means that they lose ownership to their own piece of land or intensive, industrialised farming destroy their farm land.

For rich countries such as Norway, cultural concerns take an important moral role. As indicated earlier, food production and processing is a crucial part of identity, signifying belonging in particular communities. In addition, farming involves tending the land, which is essential for protecting cultural landscapes. This is also connected to an issue that is important both culturally and politically, namely self-sufficiency. In an increasingly transnational world this may seem less important, but climate change combined with international conflicts may easily lead to difficulties in acquiring food from abroad, as has been the case in all parts of the world at times of war throughout modern history. Being prepared to provide sufficient food for one's own population on short notice will always be an important political task for any government. This requires not only that there is sufficient farmland available, but also that there exists sufficient amount of people that have competence in farming the land.

For most wealthy countries, the matter of saving the national agriculture is not only expressed in trade protection, but in a wide-ranging policy based on clearly defined values. 'Norwegian agriculture is aimed at maintaining high levels of agricultural activity in all parts of the country, implying that self-sufficiency is a goal among other non-production-related objectives. Agricultural policy has four principal objectives, ensuring that small-scale farming contributes to (1) rural development, employment and settlement; (2) supply of environmental public goods, linked to the preservation of rural landscape; (3) long-term food security; and (4) consumer welfare linked to production methods that improve the health of animals and plants.' (Gaasland *et al*. 2008: 1) Most of Norway is climatically and geographically unsuited for competitive large-scale farming. It has been almost political consensus that one should combat urbanisation and centralisation by supporting primary industries throughout the country. Keeping rural communities alive has been considered valuable on its own account but has also been supported by moral and prudential arguments. Without this heavy support, most of Norway would be without farms – and in the long run – large rural areas would be abandoned. Although other rich countries have different climatic and geographical conditions, they have similar, if less extreme, challenges regarding rural settlement and food security.

Solution: supporting labour not product?

When facing a conflict between different moral duties, it is not always clear that they are commensurable and can be weighed against each other. When it comes to protecting the environment, it is clearly relevant for global justice: Destroying the environment will reduce the resource base and chances of feeding the whole world population. If we allow deterioration of the environment, we will not have resources for feeding people even if we achieve a completely just global trade system. As it is reasonable to assume that those who will be hardest hit by climatic change are the ones we intend to help by global free trade, this conflict becomes even clearer. Thus, global free trade will only be just on condition that it does not contribute to increased release of climatic gases and environmental degradation of poor countries. Protecting future self-sufficiency is also relevant for global justice. We cannot achieve justice by undermining our own future survival. But this argument will merely imply constraints on free trade if one can make it likely that a state actually will undermine its potential for self-sufficiency by removing farm subsidies and other protective measures.

Social and cultural values, however, cannot easily be translated to issues relevant for justice, as is illustrated by Singer's (1972) 'child in a pond'-example. To phrase it in deontological terms: A negative duty of justice trumps positive duties to nurture cultural and social values of food traditions. We need a way to fulfil our duties of justice towards the poor, without sacrificing other significant values, giving meaning to our lives. One possible solution to this moral conflict between incommensurable duties and values

suggested by several authors is to separate the pragmatic and cultural reasons for keeping agriculture alive from the issue of agricultural trade protection. That can be done by altering the structure of protection from product towards labour. That is, the rich countries should pay the farmers' work rather than their products, if these products are not competitive without subsidies and protective measures. By choosing this policy, the authorities secure self-sufficiency and help keeping local traditions, cultural landscapes and rural communities alive, without preventing fair competition on farm products. This will not solve the environmental problems, but they can, as indicated above, be treated as part of the discourse on how to secure justice in global food trade.

There are some downsides to this solution. It is more transparent than the current system and it is likely that tax payers who realise how much money is spent on keeping alive small farms in remote communities will be unlikely to accept it without very convincing arguments. In economically difficult times, paying farmers for their work will be politically impossible. In addition, one can argue that subsidising labour rather than output will undermine the status of farming and the cultural value of traditional food production. By this approach farming becomes a means to an external goal, rather than a pursuit valuable in itself. The cultural value of farming is partly connected to the fact that through this direct interaction with nature we grow the food that sustains us. We do it because growing food is an essential part of the human condition, the fundamental condition for our survival. This is the ultimate meaning of farming, and its cultural and identity-giving significance is directly derived from this meaning. In changing the value of farming from the product to the activity the connection between the labour and our survival is broken. Farming becomes an activity that is pragmatically and aesthetically valuable rather than ethically valuable.

Removing the protection of agricultural support in wealthy nations will not in itself solve the problems of the poor, especially not if those rich countries are insignificant as market and as producers of food. In addition, removing trade distortions will mainly open the door to industrialised agricultural products from developed and developing countries, at least in the first years. Still, it is unlikely that countries that have significant interests in protection of agriculture will contribute to an altered global food trade regulation unless those with less to lose are willing to open their markets. This means that changing agricultural protection scheme in countries like Norway becomes mainly symbolic politics – at a significant cost. But that may be what justice requires.

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Toward sustainable agriculture and food production: an ethically sound vision for the future

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Abstract

The modern food production system is globalised, industrialised and utterly divorced from the consumer. Humans, animals and the environment have been heavily impacted due to unsustainable production methods, waste of resources and globalisation. Hence, major changes in the global food system are inevitable. In 2002, the Schweisfurth-Foundation Munich in collaboration with IFOAM (International Federation of Organic Agriculture Movements) drafted the vision statement 'Toward Sustainable Agriculture and Food Production – A Vision for the Future Viability of Food Production, Processing, and Marketing'. Its core concept is the developments of sustainable agriculture and food production, which is culturally rooted, ethically sound, economically profitable, and thus contributes to regional development, ecological health and the common wealth. The concept intelligently links regionalisation and globalisation and links traditional knowledge and modern technologies. The Vision states that food must be produced as organically as possible in order to protect the natural bases of existence and preserve plant and animal diversity. The idea favours short distances that do not incur costs to be borne by society at large for unsustainable industrial practices. Furthermore, the concept is based on an ecology of integrated cycles and close sourcing. It compounds value creation by taking metabolic products or waste and transforming them into food or green energy through natural recycling. This type of organic food production, processing, and marketing is multifunctional. It benefits several other areas important to societies. For example, this system saves energy, reduces transport costs, creates jobs, preserves occupational opportunities, protects the concept of apprenticeships, and promotes regional development. The concept has been developed further and has been successfully put into practice in several regions. This paper drafts the problems of industrial agriculture, introduces the concept and refers to a practical example of successful implementation.

Keywords: multifunctionality of agriculture, alternative production systems, sustainable food production, ethical challenges of food production

Industrial agriculture: blessing or burden?

Over hundreds of years, multidimensional rural agriculture emerged in large parts of Europe, shaping the countryside. This type of agriculture was adapted to prevailing local environmental conditions and always featured a mixture of country farming and animal husbandry. Traditional agriculture contributed a great deal to European culture by preserving people's living space and protecting its life-supporting resources (Schweisfurth *et al*., 2002: 18).

The industrialisation of agriculture has entailed enormous increases in productivity, but the price has been high and the consequences might affect food security in the long term. Even today almost a billion people worldwide go hungry, while another two billion suffer from malnutrition or live on nutrient deficient food. And while world population is steadily on the rise, the size of available arable farmland per person has been reduced dramatically during the past four decades (Von Koerber *et al*., 2009: 174).

Nowadays, the ethically critical side of the agro-industrial system is becoming more and more noticeable. Soil compaction, erosion and desertification, shortages of available resources, loss of agro-biodiversity

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through excessive fertiliser use, pesticides and monocultures, as well as seed and breeding monopolisation, which is highly productive (for a short time), high strung and disease-prone farm animals, hormones, antibiotics and pesticide residues in the food – all these problems are omnipresent and have to be dealt with in terms of food ethics (Gottwald, 2011a: 3).

In addition to ecological and health consequences, globalisation, centralisation and monopolisation within the agrarian sector will heavily affect future generations. Among these ecological and resource-related problems, loss of biodiversity is a threat to human nutrition that has been wantonly ignored. Today's global extinction rate exceeds the assumed natural extinction rate a thousand fold (BMU, 2008). Industrial management practices like deforestation, draining of swamps and land consolidation destroy biotopes; the excessive use of pesticides and fertilizers interferes with ecological balances and natural (pest) control mechanisms and substantially contributes to species extinction (Geiger *et al*., 2010; Thies *et al*., 2011; Tscharntke *et al*., 2011). Agro-biodiversity is highly endangered: today only ten crop species and five livestock breeds constitute the fundament of our global food diversity.

World hunger, food scandals and the treatment of animals within the agro-system are mainly responsible for people becoming aware of morally important problems regarding food. Modern food production has become too far removed from consumers. Studies show that more than three-fourths of German consumers are increasingly dissatisfied with their consumption and food patterns (Nestlé, 2009) – in times when food prices are at their lowest level and food is always available. Consumers are starting to realise that beyond the price, food production and consumption are inextricably linked to ethical questions such as the treatment of animals in food production, food justice and globalisation, fair trade, genetically modified organisms, consumption patterns and food safety issues (Gottwald, 2011b). These questions can no longer be ignored; and there is no denying it: global agriculture is at a crossroads. 'Business as usual' as stated by the renowned world agriculture report, is no longer an option (IAASTD, 2008: 452).

Toward sustainable agriculture and food production: an ethically sound approach

The present evolution of the global agrarian sector makes the concept *Toward Sustainable Agriculture and Food Production* more topical than ever. The concept was developed in 2002 by Karl Ludwig Schweisfurth, master butcher, entrepreneur, organic pioneer and founder of the Schweisfurth Foundation; Franz-Theo Gottwald, agrarian and food ethicist, director of the Schweisfurth Foundation, and Meinolf Dierkes, social scientist, in cooperation with the International Federation of Organic Agriculture Movements (IFOAM). The underlying idea was to conceptualise a theoretical framework for sustainable rural development which will serve humans, animals and the environment by focussing on the manifold duties and functions of agriculture.

Its main claims are:
- organic food production (ecologically friendly and socially acceptable);
- regional production, processing and marketing and rural development;
- overcoming the gap between rural and urban areas, producers and consumers;
- an ecology of integrated cycles and close sourcing.

Organic production

The organic quality of food is due to sustainable production, which protects the natural basis of existence and preserves plant and animal diversity. Ecological agriculture guarantees living conditions and habitats that are appropriate for each species of plant and animal concerned. While practicing

ecological agriculture and food production, people can take responsibility for nature – for human beings, flora and fauna, water, air, and soil (Schweisfurth *et al*., 2002: 13).

Organic agriculture is steadily on the rise. In 2011 more than one million hectares were cultivated organically in Germany. However, the proportion of organically produced food within the total food market only accounts for 3.6%, although demand has outstripped supply (BÖLW, 2011: 11). Obstacles for further growth of the organic branch are the drastic cut-backs in subsidies and the externalisation of costs within the industrial agriculture and food production system. While the price of organically produced food reflects its real costs, cheap industrial food products have outsourced environmental and social costs – with the real price to be paid by the environment and society.

Regional production and rural development

Industrialisation and globalisation with their far-reaching structural changes in agriculture have led to a decreasing number of small farms, while the remainder farms are increasing in size. Between 1999 and 2007 the 'expand or expire'-tendency has led to close to 20% of farms being abandoned – more than 100,000 businesses vanished during this period in Germany (BMELV, 2010: 7). But agriculture is multifunctional. Farmers are not only entrepreneurs – they contribute to landscape care, local recreation, soil and water protection and rural development (Gottwald, 2010: 9). Many of their activities simultaneously advance several other socially important matters. Hence, the cultural and societal impact of these losses is severe, both for individuals and local communities, but also for the society as a whole.

Decline of small-scale agriculture and local supply goes along with the loss of traditional knowledge and skills. This is particularly worrying with regard to the hunger problem in developing countries. Loss of land and livelihood are followed by a loss of knowledge about producing and preparing food. Families cannot adequately feed their children. As a consequence, these children are retarded in their intellectual and physical development, leading to a vicious circle of constant hunger (Gottwald and Boergen, 2011: 197). These people need an ecologically compatible, locally adapted low-input agriculture rather than expensive modern technologies, including high-tech breeds and seeds (e.g. Mkandawire and Mkpada, 2011). Traditional methods can be combined with innovative techniques like recycling management or composting (e.g. Gottwald *et al*., 2007). Subsistence farming, home gardens and local networks and alliances are more important than ever in order to foster food sovereignty and ensure food security in the long term.

Regionalisation and globalisation do not necessarily exclude each other. One of the concept's aims is to preserve regional identity while encouraging an international outlook. Products that are needed but cannot be produced regionally should be distributed through fair trade channels. Local communities must benefit from trade and exports in the long term. Products should add to the appreciation of regional uniqueness.

Overcoming the gap between producers and consumers

In terms of social ethics, it is a fact that regionally oriented food production creates jobs, contributes to rural development and helps to overcome the growing distances between production and consumption. Rural and urban areas are reciprocally connected and benefitting from each other; they do not exist separately, but mutually stimulate and complement each other. Direct marketing, transparency and freshness create trust and mutual understanding between producers, processors and consumers (Gottwald and Boergen, 2012). And indeed, there seems to be a growing demand for regional food (Kögl and Tietze, 2010).

Ecology of integrated cycles and close sourcing

Agriculture and food production can contribute to increasing energy efficiency and aid in phasing out nuclear energy and fossil fuels. The concept does not favour bio fuel made of food plants. Based on a holistic resource-ethics it rather promotes the use of biomass – resources, which are unusable for food and feed production. Metabolic products and wastes are transformed into food or energy through natural recycling. Depending on material and process technology, heat, cooling, electricity or fuels can be generated from manure, liquid manure, waste and straw. Food producers and processors hence can expand their business activities and become energy producers, recycling and resource managers. Within the organic branch, innovative solutions for sustainable recycling management are relatively common (Gottwald and Boergen, 2009), whereas large-scale companies still lag behind.

Finally, regionally oriented food production saves transport costs, decreases the physical separation of the production stages, and thereby reduces refrigeration and storage expenses. It also has an enormous potential for cutting down greenhouse gas emission (Demmeler, 2009: 166).

The Schweisfurth-Foundation has been refining and honing this concept. During the past years, several guidelines for the Zentralverband des Deutschen Bäckerhandwerks e.V. and the Deutsche Fleischer-Verband have been developed and published. For this commitment, UNESCO recognized the Schweisfurth-Foundation as one of their 'World Decade Education for Sustainable Development' projects in 2011 and 2012. In 2007, the concept received the *Vision Award* for its contribution to effective and sustainable food security.

Implementation

The concept is not only a theoretical framework for an ethically oriented, sustainable agriculture, but has already been tested and implemented at various economically prosperous farms and networks. One of them is the *Herrmannsdorfer Landwerkstätten,* which were founded in 1986 by Karl Ludwig Schweisfurth, long before ethical concerns regarding food production had been discussed publicly. The *Herrmannsdorfer Landwerkstätten* offer a forward-looking synthesis between agrarian production, traditional food manufacture and direct marketing. They are the centre of a network of 70 organically producing farms, which provide plants, crop, milk and meat for the in-house butchery, cheese making, bakery and brewery. Business relations between supplier and purchaser are built on trust and cooperation, transparency and control, shared values and adequate prices. Goods travel only short distances and are processed following traditional artisanal manufacturing methods.

By founding a network of organically producing suppliers, *Herrmannsdorfer Landwerkstätten* have encouraged many local farmers to convert to organic production methods and thereby have given them a long-term perspective. New jobs have been created; the entire region has become more attractive, and today is a popular destination for tourists, interested townspeople and school children.

The associated *Dorf für Kinder und Tiere* (village for children and animals) is a camp for children and adolescents where they learn how to grow, cultivate and harvest vegetables, how to manufacture cheese and meat products and how to establish a functioning, democratic and participatory working group. Most children experience agrarian production for the first time in their lives. The project demonstrates how important, successful and vivid rural and urban exchange can be.

Animal husbandry in Herrmannsdorf adheres to ethical principles. Livestock is kept as naturally as possible, able to carry out inherent behaviour, fed with species-appropriate feed and treated with respect right up to the day when they are slaughtered.

Breeding programs aim at lifetime-performance, conservation of rare livestock breeds and their adaption to conditions of extensive husbandry. The *Schwäbisch-Hällische* pig, for instance, was almost extinct in the Nineties. In Herrmannsdorf, this breed was selected due to its robustness, its distinct maternal instincts and its excellent meat quality.

Another breeding program which has attracted interest even in the media is the breeding of dual-purpose-chickens. While in industrial egg production more than 40 million male chickens are killed every year, *Herrmannsdorfer* puts many efforts into crossbreeding chickens which are suitable for both, laying eggs and fattening. This breeding program does pioneer work for the entire organic sector, which is still struggling with the unavailability of suitable breeds for extensive husbandry.

Herrmannsdorfer demonstrates that alternative concepts in agriculture and food production are highly innovative. Karl Ludwig Schweisfurth successfully realised the idea of a *symbiotic agriculture* where humans, animals and plants live together in a synthesis. For instance, pigs share their pastures with hens; while the pigs protect the fowl from predators, the hens are pecking vermin out of the pigs' skin and keep their mobile barns clean.

Not only the production, but also the processing of food combines traditional knowledge and methods with modern and innovative developments. Cheese and meat products are processed in an artisanal and traditional way. Every year, Herrmannsdorfer trains apprentices in endangered traditional artisanry and thus contribute to the survival of these crafts.

Today, there are eleven shops distributed in and around Munich, and the *Herrmannsdorfer Landwerkstätten* also collaborate with four resellers which offer their products. Karl Schweisfurth, who has been running the business since 1996, currently employs more than 120 people.

2011, the *Herrmannsdorfer Landwerkstätten* were selected to share the top three business slots for the German Sustainability Award 'Germany's most sustainable future strategies'.

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Section 11. Fish for food

Changing an iconic species by biotechnology: the case of Norwegian salmon

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Abstract

Norwegian fish farming is currently world leading both in quantity and in employing new technologies. Within Norway, aquaculture has become a large industry and represents a new way of income along the coast. However, the growth of aquaculture in Norway has been accompanied by controversy related both to potentially harmful internal effects on the fish themselves, namely animal welfare and health of the farmed salmon, and potentially harmful impacts on wild salmon by escapees from the farms and by transmission of parasites and diseases from farms to wild salmon. The introduction of salmon farming is also perceived as a threat to the wild salmon and its attached traditional cultural practices. Wild salmon plays a significant cultural role in Norway, connected to traditional ways of life on the Norwegian coast, as well as more recent practices such as recreational river angling. Public and environmental NGOs has also raised concerns about land-use change in coastal areas and the extensive use of marine resources for producing fish feed, environmental pollution from the farms, and socio-economic distributional effects by developments in the aquaculture sector. We will here explore the cultural significance of the Norwegian wild salmon, as well as its importance in a biodiversity perspective. On this background, we will discuss in what ways technological interventions as introduction of vaccines developed by biotechnologies as well as using new initiatives for breeding as marker assisted selection and genetic modification have significance for the salmon's iconic status. Does such introduction change the nature of the species and to what extent does this represent a threat to the value of the wild salmon? The technological interventions are altering the salmon and even if one can argue that there are positive aspects to the domestication of the salmon, these technological interventions may also cause adverse consequences for the salmon, e.g. welfare issues and impacts on wild salmon. Furthermore, both traditional salmon fisheries and modern recreational river angling are negatively affected by the consequences of the industry. We will explore whether the ionic status of the animal is important for the nature of the controversies and to what extent such interventions may alter the iconic value of the Norwegian salmon.

Keywords: fish farming, GM technology, biodiversity, cultural values

Introduction

Aquaculture is the fastest growing food animal producing sector in the world. Since wild fisheries are declining due to overharvesting, farmed fish has got an important role in global food supply. This has led to rapid expansion of the production of carnivorous finfish species in marine aquaculture (Deutsch *et al*., 2007). Global production of farmed salmon has roughly quadrupled in volume since the 1990s with Norway currently as the largest producer.

Salmon farming has arguably changed the perception of the species in Norway, both as a source of food and as a crucial element in different aspects of the coastal culture. In recent years two different pictures have emerged, one of economic success while the other has to a large extent been negative, including claims of pollution, problems of disease control and overuse of antibiotics, serious fish welfare problems, diminishing food quality, escape of fish threatening biodiversity, and traditional and recreational fisheries

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of wild salmon in fjords and rivers. The salmon farming industry and political authorities have rejected most of the criticisms, arguing that this is a well-regulated and sustainable food production with sufficient quality control in all parts of the production line. They admit that there are problems of escaped fish, but argue that the dimensions and consequences are manageable, and point to the significance of the industry for national economy and for keeping coastal communities alive.

The farming of fish has only been possible due to technology developments related to the use of hatcheries, net pens, fish feed, feeding stations, harvesting methods and processing. The domestication has been accompanied with systematic breeding to encourage growth, earlier sexual maturation and reproduction as well as reduced aggression. The first stages of aquaculture in Norway consisted in small, locally owned enterprises, using small nets and having relatively low production. As the technology became more advanced, it enabled larger facilities. However, with the possibility to farm salmon at a large scale, new problems arouse. The high density of fish created favourable living conditions for pathogens affecting frequency and diversity of disease outbreaks. Another important problem is related to discharges of production waste and escapees. As the technology increases efficiency and high output, it also creates new problems that must be dealt with, calling for further technology development.

New technological trajectories as transgenic fish, genetically modified (GM) vaccines and feed, are considered to be potential solutions to some of the problems the industry are facing today. A key factor to the continuous growth of the fish farming industry has been the development of effective fish vaccines. Advancements in vaccination have played an important role in the expansion of cultivation of high quality fish species like salmonids. Still, pathogens such as bacteria, parasites and viruses cause a reduction in the production of domesticated fish, and hence represent both an animal welfare and an economical problem. It has been difficult to develop traditional vaccines to protect against certain viral and parasitic diseases, and hence there is at present a high emphasis on the use of biotechnology for developing GM/DNA vaccines as well on the use of nanotechnology as carrier for vaccines or by providing new pharmaceutical solutions to this problem. Improved breeding strategies have also been emphasised from the early stages of fish farming. Initially the purpose was improved productivity traits, while the present focus is more on disease resistance, survival and product quality. Markers for genes involved in growth and controlling aggression as well as resistance to different diseases can now be used for selection either using marker-assisted breeding or genetic modification strategies.

The introduction of new technologies may not only enhance efficiency and combat diseases but does also increase the potential hazards of this industry. Assuming that the cultural value of the salmon is one of the main motivations for the negative assessments of salmon farming, we hold that this critique fails to take into consideration how fish farming itself is changing the cultural significance of the salmon, as well as its importance in a biodiversity perspective. On this background, we will discuss in what ways technological interventions change the nature of the species, and to what extent this represents a threat to the value of the wild salmon.

The Norwegian salmon as an icon

An icon is, according to Peirce (Gullvåg, 1972: 29), a sign that functions as such due to some resemblance with what it represents. The present day use of the term has disconnected it from this criterion, and now an icon is usually understood as a particularly significant symbol. When we talk about something as iconic, we mean that this sign has a special cultural significance in a particular context. The icons are such by convention, and may be restricted to specific cultures. Some of them are intercultural and may even take on a universal character. Edvard Munch's painting 'The Scream' is a perhaps an internationally recognised sign of anxiety or fear, just as the Chinese yin yang symbol is more or less internationally recognised as a sign for balance between opposing or complementary forces. But most icons have a

more restricted validity, in the sense that they are connected to particular cultures and traditions, which form basis for their meaning and significance. The icons of Australian Aboriginal cave paintings may be explained to us, but their significance presumably requires that you are familiar with the way of life and world view of the culture that produced them.

Animal species may also take on a cultural meaning of the same kind as images, and it is therefore fruitful to speak of species as being iconic in having particular cultural significance. Among species that can be said to have an iconic status internationally we may count the tiger, the panda and the elephant. But in most cases it is likely that species serve as icons for relatively restricted groups of people that share an understanding of their common past, as well as cultural expressions through myths and stories.

One such iconic species in Norway is the salmon. This status can be traced through its role in a number of stories from the Norse and Sami mythologies, folk tales and its status as food for special occasions (NOU 9, 1999). The apparently mysterious pattern of disappearance during winter and return to the same spawning grounds in summer as well as its strength in travelling upwards struggling against strong river currents and waterfalls certainly added to its semi-religious status and symbolic value. Recent research on the genetic diversity connected to different river systems adds to the status of the animal as something special, especially in Norway with its numerous fjords and rivers. Thus the salmon has historically been regarded as an animal that is revered as strong, free, intelligent and reliable, having religious significance. In addition, in Norway it has been counted among the luxurious meals reserved for special occasions.

British nobility introduced a new dimension to the iconic status of the Norwegian salmon. Recreational angling has become a favourite leisure activity throughout the country and within all social groups. The salmon is arguably a particularly valuable catch due to some of its iconic features. It is strong, big and smart. Even if you get it on the hook you are far from sure to land it, due to its strength and smartness. And after you have landed it, the meat is sure to be a treat. Thus the iconicity of the Norwegian salmon is not merely a matter of national heritage and protection of old subsistence fisheries in rural areas pursued by a diminishing group of people. It is connected to modern lifestyles, where leisure activities teach us new ways to use and appreciate nature. It is the combination of these old and new interactions with the animal that gives the salmon such a strong iconic status in Norway.

Fish farming has altered the positive picture of salmon in Norway, at least to some extent. From being food for special occasions, salmon is cheap everyday food easily accessible in food stores everywhere. The animal is no longer a symbol of the strength of wild nature independent of man, and something we have to adjust our practices to. It has become domesticated, a mass produced farm animal rather tightly packed in pens spread out along the Norwegian coast; pens that are regularly moved to new locations in order to prevent serious damage to the sea bed due to pollution. The industry controls its whole life cycle, and the farm salmon is bred to increased growth and reproductive capacities, reduced aggressive behaviour and diminished risk of contagious diseases. This affects the perception of the animal, creating a sharp distinction with captured salmon, which is called 'wild salmon' although humans have tended the salmon stock in a number of ways over the years. Calling it 'wild' is of course well suited to its symbolic status. The status of salmon as high quality food is now reserved for captured salmon in contrast to the everyday image of farmed salmon. Most interestingly, farmed salmon has a much higher status in import countries, where it is branded as Norwegian salmon both in food stores and restaurants. One explanation for this image may be the fact that it is produced along the coast and in Norwegians fjords, presumed to be clean and unpolluted areas.

Biodiversity and sustainability

Norway is bound by international and national regulations to protect the wild salmon. Norway acknowledges responsibility for about one third of the world's remaining populations of wild salmon and also environmental responsibilities through Norwegian owned salmon farming and production domestically and in other countries (White Paper, 2009: 142). The main threats to the survival of the Norwegian wild salmon originated in the mid-twentieth century increase in salmon fishing, both in rivers and by net fishing in the fjords and along the coast, partly driven by technology development. In addition, pollution, interventions in watercourses due to development, and spread of parasites and pathogens from the salmon farms led to increased pressure on the wild stocks. The fact that the north Atlantic salmon is a threatened species has received increased attention from government and research founding bodies, exemplified by a political move from protection to preservation by restricting farming and fishing close to important salmon rivers, and by initiating projects that aims for preservation and reestablishment of salmon in rivers, as well as research to gain more knowledge concerning salmon health, diseases, welfare and about environmental and biodiversity effects from the farms and by escapees.

With regard to aquaculture, recommendations for employment of sustainability can be found in the both Norwegian and European guidelines and strategies for aquaculture. The main contested values and practices of sustainable development are: what values are important within sustainable development and how to set priorities between them, and how to achieve maintenance and preservation of nature and biodiversity versus a just society and economic development (Kamara *et al*., 2006). This conflict between economics and protection is strengthened by the iconic status of the salmon. It is not a matter of protecting any threatened species, but a species that is central in the collective understanding as a particularly valuable part of Norwegian heritage and lifestyle.

Thus, protection of salmon is not merely a matter of preserving biodiversity and sustainability, but of protecting these values understood as cultural values. In this way it emphasises the connection between man as cultural being and as part of nature, and how this is interaction with nature is part of the culture.

New technologies

The fish-farming industry does focus on fish welfare, food safety and healthy foods as well as efficiency, but the most important concern is one of economics. In a recent survey among fish farmers in Norway, the most important source of risk was considered to be future salmon prices, institutional risks and diseases, and to reduce these risks it was emphasised by the respondents the need to keep cost low and ensure profitability (Bergfjord, 2009).

Technological strategies to overcome problems by disease, to increase efficiency and to decrease impacts by escapees

Recent technological developments together with knowledge gained by breeding as well as the salmon genome project and similar initiatives may provide solutions to the present challenges by diseases, parasites and escapes. For example, present vaccination approaches are limited to some bacterial and viral diseases while there are no vaccines against parasites of fish. Especially intracellular pathogens, such as virus and some bacteria, have been found to be difficult to eradicate with traditional vaccines. Hence, GM and DNA vaccines may offer a technological solution to these problems. An example of a DNA vaccine is the plasmid encoding infectious haematopoietic necrosis virus (IHNV) glycoprotein under control of a cytomegalovirus promoter (pCMV), which has been injected in Atlantic salmon with the purpose of achieving resistance to IHNV (Traxler *et al*., 1999). Moreover, DNA markers and transgenics have open up new possibilities for genetic improvement of aquaculture species (Hayes and Andersen,

2005). DNA markers have already been applied in aquaculture breeding for direct and highly accurate selection of specific traits (e.g. disease resistance). Genetic modification has enabled development of transgenic fish with improved growth rate and increased resistance to disease and stress. Improved growth rate has been possible by the introduction of growth hormone (GH) genes, where the most known example of transgenic salmon is the *AquAdvantage*, developed by Aqua Bounty. Approaches that combine interesting characteristics, as enhanced growth and disease resistance, together with approaches for development of sterile fish or fish where reproductive activity can be down-regulated is also highly relevant since this will minimise the risk of transgenic fish breeding with wild populations after accidental release or escape.

Values of relevance for assessment of new technological trajectories?

Although new vaccines and new strategies for breeding may provide improvements in production efficiency in the salmon farms, market resistance together with regulatory and trade uncertainties may arise in Europe as well in countries that focus on export markets. New vaccines as well as GM strategies for disease resistance and sterility may be more acceptable than initiatives with the purpose to increase productivity as growth enhancement. There are, however, also environmental risks and concerns for animal welfare effects by these technologies. Another important issue is whether the technological interventions change the nature of the species, and to what extent this represents a threat to the value of the wild salmon.

Considering cultural values, the industry has an approach that is concerned with instrumental economic values only, emphasising the significance of this industry for national economy and employment, e.g. to safeguard coastal settlements and increase value, sustainable management and innovation. The intention by vaccination and breeding is to change a function in the salmon, such as disease tolerance, enhanced growth, etc. Hence the resemblance with what it originally represented – the wild salmon – as well as with its origin – the domesticated salmon – has been further reduced. However, with regard to wild salmon compared to farmed salmon this change may not be too different due to the present interbreeding with escaped animals. Since new technologies allow for larger and faster changes the difference from wild/hybrid salmon may be greater and more unpredictable. For example, assuming improved fitness either by GM/DNA vaccination or GM breeding strategies, they who appreciate the cunning and mysterious salmon would say that the escape of this salmon may subsequently cause a depletion of the wild stock due to interbreeding and competition. They will argue that this represent a serious irreversible harm since a) the genetic interaction will result in reduced genetic diversity (although this may be contested), and b) the escaped GM or vaccinated salmon will replace the wild relative, which is problematic for our distinctions between nature, technology and culture, expressed in the value placed by most people on the idea of naturalness. In this particular sense the escapee is less natural and lacks authenticity when compared to the native salmon. While others would argue that this does not represent a significant harm since we will still have salmon in our rivers. They would consider this salmon to represent a substitute for the previous salmon and that it still serves a function they appreciate related to recreational activities or as a source of food. Thereby the salmon becomes an animal with more resemblance to domesticated animals than wild animals. Assuming that this view becomes dominant and affects the industry as well as policy makers, two important questions arises: have we lost the cultural significance of the Norwegian wild salmon? What responsibilities do we have for enhancing the cultural significance and biodiversity importance of wild salmon?

Iconic farmed salmon?

Already by domesticating the salmon, important elements of its iconicity is weakened, such as freedom, strength, intelligence and exclusivity. It has become something we control, a herd animal with no

mysteries left. We have to draw a strict line between 'wild' and farm salmons in order to retain the image. Due to interbreeding with escapees this line easily gets blurred. Already the traditional fjord and coast net fishing of salmon is caught in the squeeze between fish farms and recreational river angling, and is dying out. By introducing further technological alteration to farm salmon by bio- and nanotechnology, this development may continue, and the salmon risk losing its unique status. It may become the cow rather than the elk of the waterways. Even if the salmon survives as a species, the domestication and technological changes may lead to a destruction of the genetic variety connected to different spawning rivers. This is probably not catastrophic from a biodiversity point of view, but it is problematic when we regard the special significance of the salmon in the marine fauna. The interaction between man and animal is an important moral factor in the motivation for preserving endangered species. We get a poorer world by the disappearance of any species, but the loss is greater when species that play a special role in the collective understanding of a community disappears. And the domestication of the salmon is a way to eradicate it by turning it into something different. Farm salmon is not the salmon of Norwegian and Sami traditions. One can argue that it is a different species altogether.

But this is not a necessary conclusion. We can also choose to regard the domestication and technological alteration as an opportunity to enhance our relation with the species. Arguably, the development of aquaculture has alerted us to the special role and value of the salmon. Through the industrialised change of the salmon we better appreciate the uniqueness of wild, non-manipulated salmon – not as something completely different, but rather something that we stand in a relation to because it is not completely under our control. But we also do develop a different relation to the salmon as part of our husbandry. It is the basis for continued existence and growth of a number of small coastal communities, replacing the role traditionally played by fisheries. It is the source of high quality food, enabling us to protect larger parts of the marine environment from human activity. And we may even learn to appreciate the closer relation as something other than mere industrial production. Just like we admire the smart and independent wild salmon, we may also recognise these traits in the domesticated salmon, just as we admire domesticated animals such as the horse and the cat.

Utilising these opportunities for developing a positive image of farm salmon requires a lot from the aquaculture industry. They must improve the quality of life for farm salmon, reduce or rather remove escapes, and improve the quality of the meat. Then we can learn to appreciate the farm salmon as one valuable variety of the salmon as an iconic species.

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Why German consumers need to reconsider their preferences: the ethical argument for aquaculture

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Abstract

This paper addresses food production from global aquaculture. It is noted that German consumers in particular express a profound scepticism towards food products stemming from aquaculture. This attitude is reinforced by the German media, and it is supported by various NGOs with significant impact on public perception. For instance, a recent TV production supported by the German branch of the WWF attempted to portray the Vietnamese imports of Pangasius – a freshwater catfish – as unethical and unsafe. Similar films have earlier been released in regard to salmon aquaculture. There are several arguments why these presentations are, at best, only presenting half-truths, or even so biased that the result is misinformation. Current research projects, such as the EU SEAT project, are attempting to clarify the scientific information. However, the underlying consumer worries may deserve a more principled discussion, in particular in regard to ethics. This paper addresses some of the ethical arguments for aquaculture on a generic level. In order to do so, the general challenges of global food security in light of climate change are outlined as a backdrop. Then some ethical arguments are considered in more detail. These are, among others, the argument of 'naturalness', typically resulting in scepticism towards industrialized products and intensive productions. Furthermore, the argument of responsible consumption – resulting in trends of political consumerism – needs to be detailed in a different framework. It is precisely in the light and spirit of global equity, responsibility and sustainability that aquaculture products appear as ethically superior.

Keywords: aquaculture, pangasius, food ethics, consumer attitudes, natural food

Introduction

The big challenge of our times is combining food security with sustainable development. We already face a situation where globally ca. one in seven people lack sufficient access to food or are chronically malnourished. It is predicted with reasonable certainty that this situation will worsen in the years to come. Population increase and climate change are significant factors that will impact negatively on this situation. At the same time, it is a matter of fact that different regions of the world experience the problem differently. While developing countries in the South already now struggle both with population increase and climate change, these factors do not yet affect the rich countries in the North in a similar vein. Time is also a significant factor to consider. Even if we start changing our practices now, the effects will take a long time before they become noticeable.

Take the example of Bangladesh, the population in 2010 was recorded as 162 million (UNFPA, 2010: 114-116), it is expected that this will rise to ca 180 million by 2015 and to 225 million by 2050. This is in spite the fact that the Bangladesh government has already managed to decrease the birth-rate per woman from 7 in the 1970s to 2.9 in 2010?. It is one of the poorest countries in the world and it is also the country which assumedly suffers the most from climate change. One of the commodities which is scarce among its inhabitants is hope for the future (M. Kaiser, personal communication).

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Bangladesh produces among others aquaculture products like shrimps, prawns and tilapia. A large part of this production is for the domestic market, but some of it reaches markets within the EU, approximately 50% of the exports. The EU is now the world's largest importer of aquaculture products. I will therefore focus on this tiny aspect of global responsibility in the light of an ethics of equity, and examine how e.g. aquaculture products from Asian producer countries are received by the consumer, in this case focusing on the German consumer.

Consumer reactions

Approximately 60% of the German seafood market is dominated by four fish species alone: Alaskan Pollock, Salmon, Herring and Tuna. Occupying fifth place, among popular species, is now Pangasius, a new product on the German market mostly imported from aquaculture in Vietnam (dapd, 2011). German consumers are in the middle range of seafood consumption in Europe, roughly 15 kg per person/year, significantly below the top consumers in Portugal and Spain, but also significantly above countries like Hungary and Poland. 19% of the seafood consumption in Germany stems from aquaculture, i.e. most of the consumed seafood is still from capture fisheries. The market in Germany is dominated by easy-to-consume products, frozen fish, canned fish, marinades, etc.

From the reference literature examined for this paper, there appears to be no consumer survey for Germany alone which shows the special likes or dislikes of German consumers in relation to seafood, nor any survey which detailed attitudes to aquaculture especially. Most available survey data are from more general investigations, and result in a list of ten attributes that consumers appreciate in relation to seafood (cf. Bremer, personal communication). These are: (1) sensory attributes (taste, smell, texture…); (2) health and nutrition; (3) cost; (4) convenience; (5) degree of satiety (feeling of fullness); (6) food safety; (7) animal welfare; (8) environmental sustainability; (9) sharing a nice meal with family or friends; (10) fair trade.

When it comes to purchasing behaviour the German consumer seems thus to be guided by much the same attitudes as their European neighbours. There is also a niche market for so-called political consumerism, i.e. buying products as a means to exert political pressure, e.g. in regard to issues concerning animal welfare or environmental sustainability. Yet behind these attitudes there are apparently also more general attitudes that relate to what kind of food to trust or not to trust, and the kind of food that one wants to see more of. These general attitudes are typically represented in or amplified by the media or in public websites. Here it is striking that in Germany (as well as in some other rich Western European countries like the UK and Norway) a strongly critical tone towards modern aquaculture seems to prevail. One finds this, for example, expressed in the websites of regional consumer organizations, environmental organizations or similar NGOs, or in the public media. Many of them communicate a more or less negative picture of aquaculture production, portraying it as unsustainable and unsafe (e.g.: feelGreen, 2012), or products that one should best avoid (see: Bayrischer Verbraucherschutz, 2012). This is in line with the negative tone towards aquaculture products that has prevailed in the German press for a long time. For instance, the project Aquamax researched the press coverage of aquaculture in four European countries (UK, Germany, Norway, and Estonia) for the period May 2002 to May 2007. The findings indicate a clear tendency to focus on risks, both in relation to environmental risks and health risks, whereas benefits were only apparent in relation to economical aspects. It is striking how for example health risks were amplified in the press, while health benefits, even when clearly documented in the scientific literature, were largely neglected (Aquamax, 2009). One recent influential example of this is the negative media coverage in the ARD TV production 'Die Pangasius Lüge' (2012). This film portrayed the Vietnamese Pangasius aquaculture as environmentally disastrous and exploiting poor labourers, adding up to an unsafe product. One sided reporting of information like this caused the vice-chair of the Fishery Committee of the EU parliament, MEP Struan Stevenson, to present a speech against Pangasius

imports from Vietnam (Stevenson 2010). After being updated on recent research findings, such as the SEAT project at Stirling University and after a personal visit to Vietnam, inspecting the production of Pangasius, he retracted his earlier claims, now supporting the import of these products (Stevenson, 2011; cf. SEAT, 2012): 'I told you how three years ago I launched a savage attack on Pangasius imports. Well I subsequently had to eat humble pie on this issue....or maybe I should say Humble Fish Pie! It is always difficult for a politician to admit to being wrong, but...' that is what he did.

For this author, the above media coverage raises a number of serious questions. The first and most obvious question is certainly whether it is indeed true that aquaculture products are in general unsustainable, unsafe and inferior. This question is best answered by detailed scientific investigations and examination of data. The SEAT project (cf: seatglobal.eu) is one such attempt to provide empirical data with relevance for answering these questions. I shall not attempt to provide an overview of the findings of the project to date, though the data so far seem to paint a different picture than the one that merges in the (as e.g. the above episode with Struan Stevenson indicates).

Attitudes and ethics

The role of projects such as SEAT, discussed above, is suspected to be only part of the answer to the challenge of the one sided press that aquaculture is subjected to. I believe that the media coverage is just a mirror-image of some more deep seated value-based attitudes among consumers. These attitudes relate to the value and quality of industrial food production in general. I hypothesise here that even if all the scientific facts were put on the table, the prevailing attitude would still be something along the following lines: 'Well, perhaps it is not as bad as we thought, but we still prefer to go for the natural product which in any case will be better and more sustainable. You can't beat nature, can you?'

As convincing as it may sound at first, I think there are a number of things wrong with this generalised attitude presented above, also wrong in an ethical sense, and this is discussed below.

Firstly, I think it is the expression of a movement of people who Rachel Laudan describes as *Culinary Luddites*, similar to the people who reacted to the movement of workers against the machines that destroyed their traditional way of life in the 19th century (Laudan, 2001). *Culinary Luddites* are people who strongly believe in a counterculture to our present dietary habits, a moral and political crusade against convenience and fast food, and a turn back to more traditional and supposedly more natural ways of food production and preparation. The point Rachel Laudan makes against *Culinary Luddites* is that they are 'wrong' in regard to history and 'wrong' in regard to morals. By means of historical examples she shows that foodstuff all through human history was processed in some way or other in order to make it more digestible and safe. Unprocessed food is in many instances just toxic or difficult to digest. The picture of the primary food producer enjoying the healthiest and most nutritious food because he gets food unprocessed is historically wrong. And this is where her second point comes in: quality food was a marker of social privilege and wealth. The rich urban dweller could afford a great variety of more or less processed food products at the markets, while the poorer rural communities were suffering from malnutrition and hunger. It was only with the rise of the modern food processing industry that social food equity and security was brought about in the rich countries, improving also food safety.

Secondly I think that *Culinary Luddites* and many modern consumers, perhaps in particular but not only in Germany, adhere implicitly to a highly problematic Romanticist worldview, i.e. the view that 'natural' must be better than 'artificial', and that tempering too much with what is natural must result in problems if not outright catastrophe. Traces of this viewpoint were also visible in the debate about GM crops. Romanticism was a revolt against the scientific spirit of the Enlightenment and the rationalization of nature. It found its expression in visual art, in Germany for instance in the works of Caspar David

Friedrich, but also in other arts, represented by such names as Goethe, Schiller, Hölderlin, Wagner and others. What Romanticism implies concretely is not quite clear in the literature. However, two characteristics can, I think, be extracted: first, the contention that unspoiled nature represents both Beauty and Good, an organic unified whole representing the art of a Deity (thus countering the view of nature as a machine), and second that human intuition, instincts and feelings provide a good guide through life, in many ways superior to the cold rationality of scientific insights. Philosophically speaking there are many things wrong with a romanticist outlook. One major flaw is that any dichotomy between nature and the artificial overlooks the inherent cultural and social construction of both terms and the fluidity between them. Agriculture (as *mutatis mutandis* aquaculture) in any form is obviously the cultivation of land and the selection of crops for food production and thus far removed from anything occurring naturally. Our cultured land is both artificial and natural in the same way as our forests are. Furthermore, a romanticist outlook that associates moral qualities or evaluations with nature, is confronted with the naturalist fallacy, i.e. there is no way to deduce what is good or right from what is simply a fact of nature. Nature is for good and bad, and we alone have to make this value judgment. Yet, in the area of food a romanticist outlook still provides a strange attraction for many people.

Thirdly I think that the attitude expressed above is morally wrong in terms of global equity. It seems to presuppose a free choice between seafood products obtained from the oceans by capture fisheries, and seafood products obtained from aquaculture which implies a planned production of these products. Yet the question must be for whom such a free choice is realized in practice. Insisting, as German and other European consumers do, that they rather go for the products from fisheries, implies that they have the monetary power to do so. But our oceans are already overfished and consequently the market prize for fish from ocean fisheries has risen significantly. Thus a consumption pattern based on fishery products can only be maintained by the rich parts of the world, excluding the majority of other people. Furthermore, it contributes to increased pressure on the ocean resources. Thus if one believes that the morally right choice will favour seafood products from capture fisheries, this belief could not meet the Kantian test of being realized universally. In principle it would result in a privilege of the rich to exploit the commons to the detriment of the poor.

Fourth, the attitude portrayed above misses the chance to take ethical responsibility for the consequences of the lifestyle one is leading. As our Western consumption pattern is a major contributor to climate change, and the effects of climate change are globally unequally distributed, hitting the poor parts of the world more severely than the rich parts, one might make the moral argument that the richer part of the world should be willing to provide some kind of compensation for these consequences. One way to do so is actually through global trade. Being able to trade e.g. aquaculture products with Europe provides for some significant prosperity in the poor producing countries. Resources for aquaculture production in these countries are still bountiful and capacities to do so in a sustainable manner exist. While there is little we can do to effectively 'wind back' climate change and its consequences, there is a lot we can do – and should do – to mitigate its effects, particularly in relation to those who suffer the most and are the least to blame.

In all of this there is, of course, a paradox, namely that the revealed preferences of consumers, i.e. what they actually buy in the supermarkets, do not necessarily match their expressed preferences. This is a well-known fact in the food industry, observed also in other walks of life. In terms of sales, aquaculture products occupy a considerable market share. But at the same time we witness the rise of political consumerism, at least for the more privileged groups in society, making up a niche market. These groups define new trends and they set standards. But in these groups which claim the highest ethical standards for themselves, aquaculture is beset with a strongly negative image.

If there are some strong ethical arguments favouring aquaculture products, what does this then imply in terms of concrete actions? The answer cannot be an uncritical attitude towards aquaculture products in general, since the industry does need further positive pressure from consumers to improve its production. But we need to work for a change in the underlying negative consumer attitude towards aquaculture as such. One way to do this would be through better labelling and communication about the realities behind our food. An *Ethical Aquatic Food Index*, as the SEAT project strives to develop, would be one such measure that may point the way. The consumer must have access to relevant facts that make a significant ethical difference in order to be able to leave feelings and ingrained prejudices behind, and make informed choices in the supermarket. In the long run, aquaculture has only to gain from this.

Conclusion

I have been attempting to show that there are inherent weaknesses in the widespread public attitude against aquaculture. The argument is meant to apply on a generic level. Thus I am not denying that there are indeed a number of problematic examples of aquaculture products. I do believe that there is a need to improve our aquaculture production both in the direction of more sustainability and in the direction of ethical concern, e.g. in regard to animal welfare. Yet, most of these challenges address specific management practices, while many important consumer issues like food safety are already well regulated. I am also not denying the need for greater transparency and better labelling in regard seafood products. But what I attempted to do here is to cut through an undercurrent of deep-seated beliefs and attitudes that at the outset disadvantages aquaculture products generically. I find these attitudes morally wrong, given our global responsibility for food security and social equity. I suspect that many German consumers would be surprised to find out how elitist their scepticism to aquaculture really is. It is precisely because of their insistence on sustainable and ethical food products that they should open their minds for a variety of aquaculture products.

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Fish for food in a challenged climate: ethical reflections

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Abstract

By tradition fish has been counted in kilos, parallel to broilers, none of them treated or traded as individuals, and seldom considered as objects of moral concern in animal ethics. Compared to debates about intensified production of other species welfare is an almost non-debated issue in fish farming. There is however accumulating evidence, based primarily on behavioural responses, that fish (teleostei) have the capacity to feel pain. This calls for a change of both practice and of scope of ethical concern, for the benefit of both human and fish welfare. Acceptance of this new knowledge and adaptation of new farming practices is however a slow process, and fish welfare might even be 'purposely ignored' out of pragmatic reasons – to meet global food supply in an economic feasible manner. Aquaculture is sometimes regarded as one of the most promising solutions to food insecurity, partly thanks to being less detrimental to the climate than other forms of animal production. However this is not uncontroversial: a vegetarian diet is preferable in terms of climate effects and there are reports on health risks associated with consumption of fish, as well as environmental concerns for both aquaculture and wild catch. Further, an increase of fish farming probably includes not only a higher number of facilities but also an intensification of farming practice which in turn has consequences for fish welfare. This paper takes three not too risky statements as its point of departure for an elaboration of the ethical aspects of production of fish for food: (a) global fish consumption is increasing, (b) global population increase is a challenge to food security and global climate and (c) concern for fish welfare is very low. An ethically informed reformulation of aquaculture and fish capture in the light of food supply concerns has thus to consider not only fish welfare or global food security but also e.g. health aspects in fish consumption and climate challenges of the fish-for-feed production system.

Keywords: aquaculture, ethics, fish capture, fish welfare, global food security, food safety

Introduction

Presenting oneself as vegetarian at a restaurant one often is met with the reaction 'no problem, we can serve you fish'. I have always been puzzled by this answer, and probably answered in a somewhat surprised manner 'oh.. no thanks, I think fish are animals...'. If this person also gets to know that one's reason for being vegetarian is animal welfare concerns, the person often seems surprised – thinking something like 'ok, fish are animals, but they don't feel, do they?'

Ever since the influential English utilitarian Jeremy Bentham (1748-1832) argued 'the question is not, Can they *reason*?, nor, Can they *talk*, but Can they *suffer*?' (Bentham, 1789) the capacity of animals to experience pain and suffering, as well as pleasure and happiness has been central not only to animal ethics, but also in the discussion on regulation of animal protection and legislation (FAWC, 2009; Sandøe and Christiansen, 2008; Vapnek and Chapman, 2010). Fish has been remarkably absent in animal welfare research, animal ethics or legislation as the general notion have been that they do not have the capacity to feel pain and suffer. Although the EU Treaty of Amsterdam (1999) states that welfare of all animals used by humans (mammals, birds and fish) for food shall be protected by the Treaty, fish welfare is seldom explicitly taken into consideration. EFSA (2009: 6) concludes that 'Fish welfare however has not been studied to the same extent as terrestrial farm mammals and birds, neither welfare concepts nor welfare needs have been clearly understood for the various species of farmed fish.'

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In 2013 a new EU-directive (2010/63) on research animals will be in place and apply also to fish: to 'live non-human vertebrate animals' and to 'independently feeding larval forms, foetal forms of mammals as from the last third of their normal development; live cephalopods'. (Article 1:3a-b). Although all vertebrates, i.e. also fish, are included in the directive (EU 609/86) interest in fish welfare has been low also within research. Responding to the lack of guidelines for implementation of the 3R´s (replacement of animals, reduction of animal numbers and refinement of research methods) in relation to fish as laboratory animals, a group of researchers have formulated guidelines for assessing the degree of severity of the research. The idea is to help those who perform research on fish to apply the new directive (Hawkins *et al*., 2011) (http://www.norecopa.no). Their point of departure is that welfare matters for fish. The inclusion of fish in animal welfare regulation combined with the increased use of fish as research animals and for human consumption in aquaculture, one can expect a growing need to consider fish welfare in ethical and scientific welfare terms.

Fish as sentient beings

Biologically fish are divided into three major groups: *Agnatha* (hagfish, lampreys), *Chondrichthyes* (sharks, rays, sturgeons) and *Actinopterygii* (bony fish with teleost being the most prevalent). Most aquaculture finfish species are *teleosts* (EFSA, 2009), and consumption fish belongs also to the Chondrichthyes (Jalmlöv, 2011). There are about 55,000 species of vertebrates and more than half of them are fish. Hence knowledge is by necessity limited about each single species and conclusions cannot be drawn from one fish species to another. That is, just as for mammals, research is bound to be species-specific. It is however crucial to bear in mind that lacking knowledge is not per se a basis for denying the existence of a capacity. As EFSA correctly states 'absence of sound scientific evidence at present should not be seen as evidence of absence of suffering in farmed fish, and this fundamental principle is entrenched in the Treaty [of Amsterdam].' (EFSA, 2009: 5).

Although much knowledge still is to be gained, research on fish capacities and welfare is not an entirely new field. Different results of fish research have been put together and analysed in the EFSA-report 'General approach to fish welfare and to the concept of sentience in fish. Scientific Opinion of the Panel on Animal Health and Welfare' (EFSA, 2009). Here the most recent studies but also early formulated results regarding pain perception and adaptation to the environment are scrutinized. Many studies have focused on brain structure and reactions to different substances in order to map differences to other vertebrates. EFSA states that 'Together, these studies indicate that the brain opioid structures are similar between fish and other vertebrates.' (EFSA, 2009: 14). After summarising a wide range of such specific research results it is stated:

> different species of fish have evolved highly sophisticated sensory organs to survive in changing and varied environmental conditions. There is scientific evidence to support the assumption that some fish species have brain structures potentially capable of experiencing pain and fear. The balance of evidence indicates that some fish species have the capacity to experience pain. However research and developments in the area of cognition and brain imaging techniques should be carried out in fish to further our knowledge and understanding of pain perception. (*ibid*. 3)

Thus, independently of the exact level or degree of pain perception or behavioural change there is ample evidence that the species used in research – which to some extent coincides with the ones used for food e.g. Atlantic salmon, gilthead sea bream, sea bass, rainbow trout, carp and European eel – have capacities to experience pain and adapt their behaviour to the context. Hence fish welfare is not only valid as a legislative concept, but also in animal ethics and for further scientific research on capacities. But, can fish welfare be considered if also climate and food security issues are at stake? In the following first some climate factors in fish production and thereafter aspects of food security and health issues are discussed.

Different climate impact between wild caught fish and aquaculture

While striving to reduce food security a core question is whether fish consumption is less detrimental for the climate than other meat consumption? According to Kiessling 'fish are without comparison the most efficient protein-transforming higher animals ever farmed by man. This is as true for modern salmon farming as it is for traditional poly-culture of tropical fish.' (Kiessling, 2009: 309). If this is true, i.e. that from a climate perspective whenever possible one should eat fish instead of other meat. However a range of further issues need to be discussed in an ethical argumentation in order to balance the core ethical aspects.

From a climate perspective 'a fish is not a fish'. Ziegler (2009) describes wild caught fish and aquaculture having their own specific factors of climate impact. She describes some key climate factors related to wild catch, showing relevant differences. Species specific behaviour and location matter; species living tight together in a mid-water level are more energy efficient to catch than seafloor fish. Hence stock density – in biological terms – matters: low-density fish stocks require more time and fuel per kg landed fish. This is related to differences in biological status of the species; catch of those on the red list might be less efficient. Also in relation to this of course type of fishing gear ('active' or 'passive') has an impact on energy use. 'In other words, in addition to the fishing method, the stock situation is a key factor in determining the energy efficiency of fisheries.' (*ibid*. 343). Besides diesel for fuel Ziegler points at the cooling equipment having a substantial negative environmental and climate impact.

In aquaculture on the other hand feed production is the largest factor of climate impact,. (Kiessling, 2009: 303). The use of diesel is another key factor through catch of small fish for fishmeal and fish oil, but also in the production of feed based on soybean, maize and wheat. (Ziegler, 2009: 347). In aquaculture 'the ranges of marine and agricultural ingredients overlap, so that the most intensive crop derived inputs give rise to more global warming emissions than the least intensive marine inputs.' (*ibid*. 347). Hence there is a relevant difference between farming herbivores (tropical) or carnivores (cold-water), and to enable a consumer choice of fish based on climate impact, it is as necessary to inform of the differences between different kinds of fish and production methods as it is when enabling an informed consumer choice of meat from livestock.

Fish for food: food security

According to FAO Fisheries and Aquaculture Department aquaculture has had a significant growth:

> Since 1970, fish production from aquaculture has increased at an average annual rate of 6.6%' and continues; in 2008, humans consumed about 80% of the world's fish production – 17.1 kg per person – and by 2030 consumption is expected to rise to as much as 20 kg each year. The other 20% is mostly processed into fishmeal and fish oil. ... *If overall production is to keep pace with an expanding world population, and if capture fisheries are to remain stagnant, future growth will have to come from aquaculture.* (SOFIA, 2010, italics mine).

For such a statement to be solid, it needs to imply that farmed fish is healthy food, an issue elaborated on below. Further, if fish is a more efficient protein-transformer than any other farmed animal, it could be argued that aquaculture should be promoted as a means to meet protein needs in regions of poverty and where malnutrition is frequent. It is worth remembering though, that in general the developed countries set the agenda for global trade by regulation, subsidies and recently by buying land and maintaining production in other countries. Hence farming systems that ensure sufficient farming of essential foods for the home market becomes a crucial factor in developing countries. 'Good infrastructure and investments in human capital will improve the productivity of labour and increase access to capital, benefiting local business and enhancing the development of rural communities.' (Subasinghe, 2009: 287).

Although fish already constitute between 19-22% of animal proteins in Africa, compared to Europe (11%) and North America (7.6%) (Ababouch, 2009), Sub-Saharan Africa is regarded as a potential region for expanding aquaculture that, if integrated with agriculture, can contribute to stabilize and diversify farm output and increase also food security on family or village level (Hambraeus, 2009). Hambraeus stresses that although interest in aquaculture increases and it has great potential for improving food security, increased specialization in fish farming aiming at cash crop for export is a challenge, and constitutes a potential threat against increased food supply in a certain region (*ibid*. 336). Ababouch offers a detailed analysis of the effects of increased global trade with fish and concludes it is a highly complex phenomenon. Among a number of effects of global trade he argues that it might be beneficial for poor fishers in non-fish-eating communities to export the fish. On the other hand export of fish leads to deprivation of a necessary source of food and to higher prices in areas where a fish diet is an integral part of the culture and hence might cause food insecurity (Ababouch, 2009: 389-390). Hence aquaculture has a potential for reducing poverty, but the production systems need to be structured to ensure integration in cultural patterns and regional food security by increased diversification of farm output.

Fish for food: human health aspects

Given that fish constitutes a substantial part of a given population's diet, and will continue to do so or even increase, health issues become strongly relevant. 'Numerous developing countries rely on fish as a major source of protein; in 28 of them, fish accounts for over 40% of animal protein intake.' (SOFIA, 2010). According to Hambraeus this can be beneficial for health since 'seafood represents a valuable source of essential nutrients ... . This has led to an increased interest in their potential to decrease the incidences of cardiovascular, cancer and inflammatory diseases.' (Hambraeus, 2009: 325). At the same time recommendations of restricted fish consumption are given by governmental agencies. Pregnant and breast feeding women in e.g. Sweden are advised not to eat certain wild fish species (herring, perch, pike and walleye) due to high levels of PCB, dioxin and methyl mercury (National Food Agency). This view is shared by Hambraeus stating that 'some of the seafood items may contain potentially hazardous compounds and be carriers of various exogenous toxicants from environmental pollution' (*ibid*. 326). Such toxins are stored in the body for a long time, which increases the risk of toxic reactions. A further health issue is related to global trade itself. Ababouch argues that fish trade calls for a fish food safety strategy for both capture and aquaculture since there are 'risks of cross-border transmission of hazardous agents. Likewise the rapid development of aquaculture has been accompanied by the emergence of food safety concerns, in particular residues of veterinary drugs.' (Ababouch, 2009: 394).

Discussion

Ideally there would be no food insecurity and all food would be produced in sustainable systems without causing any suffering. As reality is far from that, this paper points at the question: is it ethically better to eat fish than other meat? One reason to say yes could be if fish is not sentient. In none of the referred articles or reports on fish in relation to food security, climate challenges or health fish is considered as animals with 'a welfare of their own'. Here fish welfare is not an issue at stake, even less so an ethically relevant one. However, if animal welfare is considered relevant for sentient beings, and recent studies have showed that a range of fish species used for human consumption are sentient, how we treat them is ethically relevant. Those who are sceptical about fish sentience and therefore tempted to ignore fish welfare issues will still have to argue – on a moral level – against applying the principle of giving 'the benefit of the doubt' to the weak part. It is therefore not per se more correct to ignore the welfare of an individual fish than that of other animals. Hence fish welfare should be included in any evaluation of the benefits/disadvantages of fish farming and capture to reduce food insecurity. Here arguments for vegetarianism seem strong as it would do most to reduce negative impact on climate and animal, including fish, welfare. In many parts of the world this would also contribute to improve public health.

The ethically more difficult issue is the balance of food security and fish welfare – are poor people entitled to eat fish, even if this has caused low welfare in fish? Yes, if fish eating is essential for survival. Hence food security seems to be the dividing line.

Being realistic, vegetarianism will not be all people's choice in developed countries. I believe there is one common trait in the perception of the three issues (climate, food security and fish welfare) reducing willingness to change one's habits – it is difficult to realise the negative effects. Either while they seem to be in a distant future, in a very distant part of the world or difficult to understand, respectively. Nevertheless people in developing parts of the world daily suffer from these effects, whereby realisation of personal responsibility by us having a range of choices is called for. Here an ethics of virtue could be a strong candidate calling for personal responsibility both among people working in fish industry and consumers. Virtues such as *attentiveness* to the issues at stake, *responsibility* for own actions, *competence* in judgment and discernment, and *responsiveness* towards affected individuals can contribute to well informed and empathic choices towards humans and animals (Gjerris *et al*., 2011). Further, given that 'aquaculture is the fastest growing food producing sector in the world since the 1990s' (Subasinghe, 2009: 281) with great potential to fight food insecurity there are possibilities of creating awareness about fish welfare at different levels (employees, legislators and consumers) (Lund *et al*., 2007) along with increased production. Welfare state of fish might be more difficult to detect than by other vertebrates, but it is of no less ethical significance. Limitation to what we are able to see is not equal to limitation to our ethical responsibility.

Conclusion

In this paper fish welfare has been related to three ethically relevant aspects of increased fish production and consumption; climate aspects, food insecurity and healthy aspects of fish as food. It could be concluded that increased fish consumption is not a one-dimensional positive undertaking. However, by adding fish welfare to the discussion on food insecurity, health aspects and climate change, one asks for something that is on the one hand obvious (sentient animals are to be considered) and on the other hand hoping for a level of respect not ensured even for mammals. Hence, one can expect respect for fish welfare to lie in a distant future, at most. In the meantime consumers in developed countries have a responsibility to support elimination of food insecurity supporting farmed fish from sustainable and culturally well integrated systems. If not becoming a vegetarian, it is possible to choose products with low negative climate impact, biologically stable fish species before unstable species, captured by sustainable methods.

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Section 12. Food and sustainability

A theoretical framework to analyse sustainability relevant food choices from a cultural perspective: caring for food and sustainability in a pluralistic society

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Abstract

Food production and consumption is one of the main pressures on the environment. The fact that diets have to change into a more sustainable direction is generally agreed upon. There is, however, no shared vision of a sustainable and desirable society to support these changes. This paper aims to develop a framework that can account for value pluralism from a multi-layered perspective, drawing distinguishing parallels between the cultural and the individual level and focusing on types of motivations underlying consumer food choices. It is suggested that theories of culture need to be combined with theories that account for the individual level of motivation. On the individual level, the concepts of intrinsic and extrinsic motivation are developed further. On the cultural level, the cultural tensions in Western culture between a utilitarian approach towards nature and an emphasis on intuition and creative imagination are discussed. It is argued that a combination of both levels will enrich predictions the predictions and promotion of sustainability-relevant food choices.

Keywords: collective food culture, intrinsic motivation, self-determination theory, sustainable food choices

Introduction

Food production, especially meat, is one of the main sources of human pressure on the environment (Steinfeld *et al*., 2006). This pressure on crucial resources (i.e. water, biodiversity, energy), food security and human health, could be reduced if people in Western countries were to eat smaller quantities of meat and more environmentally friendly proteins, such as plant-based options (De Boer And Aiking, 2011). Although the need for such a change has frequently been advocated, there is no shared vision of a sustainable and desirable society to support it (Costanza, 2000; Jackson, 2005). The development of a shared vision is especially difficult for two reasons. Firstly, the definition of sustainability is not unequivocal, which is why we focus here on aspects of environmental and human health (Lang & Heasman, 2004). Secondly it is typical for modern society that competing values can exist simultaneously (Giddens, 1991; Taylor, 1989). Indeed, values compete in their influence over many food-related areas, such as discussions on the merits of organic agriculture (Mann, 2003), the contribution of vegetarian diets to health (Sabaté, 2003) or the continuing increase in the prevalence of obesity (Flatt, 2011). This value pluralism has a special cultural background that is often neglected within marketing approaches around consumer segmentation. Yet, the challenge for policy-makers may be to recognize and organize pluralistic values in such a way that they together lead to a more sustainable food system in the future. Consumers will play an indispensable role in meeting that challenge, but they are to varying degrees mindful of their food choices and also diverse in their food-related values (De Boer, *et al*., 2007; McEachern and Willock, 2004; Tanner and Wolfing Kast, 2003; Tarkiainen and Sundqvist, 2009). To better understand the potential implications of these pluralistic values, the present paper takes a closer look at linkages between motives at the level of individuals and the long-term cultural processes that have fuelled significant controversies about sustainability issues. It explores what these linkages mean for the pursuit of more sustainable food choices. This paper will first, from a philosophical perspective,

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briefly describe the main cultural tensions that may account for competing values in food-related areas and then, taking a psychological perspective, focus on the motives behind the practices of individuals.

The cultural level

One of the few scholars who have captured the cultural tensions of modern society in an authoritative way is the philosopher Charles Taylor (1989). He has demonstrated how the tensions between certain key values are connected with the development of Western culture since the eighteenth century. The way in which modern people judge their lives and their relationship to the natural world has, according to Taylor (1989: 319), been formed by two big constellations of ideas. The two constellations involve, on the one hand, an emphasis on reasoning and utilitarian thought, which fits with an understanding of nature that has no meaning beyond its function for humankind and a value that is only dependent on utility. On the other hand, there is an emphasis on intuition and creative imagination, in which mankind is seen as an integral part of a larger order of living beings that sustains human life and fosters a kind of solidarity in the process of life. On the individual level, this contrast does not describe distinct categories that people fall into, but it serves to express a polarity and the tendency of a person to lean towards one or the other. What both modern visions of the self have in common is that they are inward oriented, emphasizing one's capacity of either reasoning or intuitive feeling. Thereby they are different from the traditional vision of the self, which is primarily oriented to an identity defined by social rank and kin-lineage (Baumeister, 1987). In addition to the features of modern selves, modern culture is also characterized by the tension between the two big constellations of ideas (Taylor, 1989). This tension becomes manifest, for example, in the form of controversies about sustainability issues, such as strong disagreements between those who emphasize that pollution will be solved by technical means and others who stress that people should be open to nature and adapt to it (Taylor, 1989: 384). Similar types of antagonism can be observed between proponents of technologically advanced systems of high volume foods and adherents of speciality products, including organic agriculture (Gilg and Battershill, 1998; Mann, 2003).

The utilitarian approach to nature is closely associated with the industrialization of the entire food system, particularly in the Western world and all activities that are carried out to feed the growing world population, for instance, with meat (Steinfeld *et al*., 2006). This approach has led to highly standardized meat production, which is commonly sold in supermarkets and de-animalized to avoid reminding customers about the link between the meat dish and the killing of an animal (Vialles, 1994). In general, the utilitarian approach has successfully combined functionality with some eating pleasure, as many people have gained access to protein-rich food. However, its scale may have reduced meat's special character; the industrial way of meat production appears to have difficulties in communicating the taste for high quality food to consumers (Grunert, 2006) and it raises worries about its impacts on culinary traditions, care for food and health (Fischler, 1999). The utilitarian approach has also shaped many practices at individual level. For instance, it accentuates the repetitive and routine character of many food-related tasks, such as grocery shopping (Thomas and Garland, 2004). And it may lead to consumers being almost mindless in the kitchen, captured by a convenience orientation towards meal preparation (Candel, 2001). In contrast, non-utilitarian approaches to nature foster a kind of solidarity, in which food and nature have to be used carefully to better protect environmental and human health (Lang and Heasman, 2004). These approaches are associated with the development of markets that provide a variety of organic, natural, or locally sourced products, which enable growing numbers of consumers to internalize ideas about 'eating green' in their personal behaviour, be it either with more spiritual or with more secular sides (Dryzek, 2005; Jamison, 2003). Regarding organic foods, the markets in Western countries are growing dynamically since not just speciality shops but also mainstream retailers are making these products available to their consumers (Baker *et al*., 2004; Sahota, 2009). Hence, at

least part of the cultural tensions between utilitarian thought and intuitive feeling can be examined in terms of food-related practices and beliefs at the level of individuals.

The individual level of motivation

To fully understand the relationship between cultural processes and the behaviour of individuals, it is necessary to consider their type of motivation. According to motivation theories (e.g. Deci and Ryan, 2000; Higgins, 2000), people's behaviour is most likely shaped by those cultural factors in their immediate context that match their type of motivation. Self-Determination Theory (SDT, e.g. Deci and Ryan, 2000) and Regulatory Focus Theory (RFT, e.g. Higgins, 2000) both distinguish two main types, which are independent of each other. The first SDT-based type is intrinsic motivation; a person who is intrinsically motivated, for example, to care about food is self-determined and undertakes an activity for its own sake, such as the inherent enjoyment it provides. The second SDT-based type involves persons who are extrinsically motivated; they are not self-determined but engage in an activity to obtain an outcome that is separate from the activity itself, such as children who are being rewarded for eating non-preferred foods. In short, a person feels self-determined (i.e. authentic and competent) about behaviour that is intrinsically motivating because it reflects practices that have been fully internalized and integrated within one's core values (Kasser, 2002). To integrate a practice, the person must grasp its meaning and synthesize that meaning with respect to other goals and values (Deci and Ryan, 2000). Therefore, a person who is intrinsically motivated to care about food may adopt other food practices, which are more appropriate to the notion of care, than those who are extrinsically motivated.

Intrinsic motivation to care about food includes the more often studied concept of involvement in food-related activities, as long as involvement can be understood in terms of a person's level of interest in the activity (unlike ego involvement, see Deci and Ryan, 2000). The concept of involvement is well known from the literature on consumer behaviour (Bell and Marshall, 2003; De Boer, *et al*., 2007; Tarkiainen and Sundqvist, 2009). Typically, persons with a high level of involvement in an issue, such as a product category, tend to make informed choices based on relatively active and mindful information processing, provided that their self-interest is not harmed by the outcomes (Darke and Chaiken, 2005). Although in the case of food even lowly involved consumers have to make choices every day, they can do this by relying on relatively mindless ways of information search and well-established attitudes (e.g. Verbeke and Vackier, 2004). Lowly involved consumers may be proud of easy successes but become helpless when they face possible failure. In general, SDT claims that a mindless way of doing something is far less satisfying than a way of living that is focussed on what is intrinsically worthwhile to human beings, namely competence, autonomy and a sense of where one fits in to a bigger picture (Ryan *et al*., 2008). Earlier work (De Boer *et al*., 2007) suggests that in the case of food the bigger picture may refer to one's place in nature ('eating green') or in a taste culture ('being a gourmet'). According to Deci and Ryan (2000), the notion of connectedness appears to provide 'a distal support' for intrinsic motivation.

Higgins' (1997, 2000, 2006) Regulatory Focus Theory specifies two basic motivational orientations, termed promotion and prevention, which underlie people's concerns with obtaining positive outcomes (including nurturance) and avoiding harm, respectively. In the case of food choices, a promotion orientation may include all the social and culinary motives that emphasize the importance of food as a positive force in life. In contrast, a prevention orientation may emphasize those food choice criteria that ensure protection from personally felt threats, such as criteria on the moral and health aspects of eating. A person's momentary focus on promotion or prevention will depend on circumstances induced by the situation at hand in combination with his or her personal history and cultural background. Using a survey questionnaire among the general population in the Netherlands, de Boer and colleagues (2007) have shown that consumers' level of involvement in food can be separated into promotion-oriented and prevention-oriented motivational goals. Promotion-oriented high involvement in food can be described

as focused on a varied and adventurous taste (see also Ullrich *et al*., 2004; Wycherley *et al*., 2008), which contrasts with the opposite pattern of preferences for an ordinary meal. Prevention-oriented high involvement in food can be described as reflective attention to the wider implications of food choices in terms of health, naturalness of the food, weight control and ethical considerations (see also Pollard *et al*., 1998), which contrasts with the opposite pattern of being easy about food. Taste-oriented consumers were much less concerned about safety issues and more looking for stimulating experiences than reflection-oriented consumers. Despite these different orientations, however, both types of highly involved consumers had their own reasons for choosing more carefully produced meat (De Boer *et al*., 2007); taste-oriented consumers associate such a certified product with sensory quality and reflection-oriented consumers care about the welfare of the living animal.

A framework to analyse sustainability relevant food choices

Based on the analytical framework proposed above, one can proceed to gain an understanding of some more specific beliefs consumers hold about themselves and food, along with the implications thereof for food sustainability. Recent approaches to SDT depict self-determination as a kind of continuum and make a number of additional distinctions (e.g. Pelletier *et al*., 2004; Vansteenkiste *et al*., 2005). Figure 1 shows five types. The first distinguishes intrinsic motivation from internalized extrinsic motivation. Intrinsic motivation refers to the inherently enjoyable aspects of an activity, such as cooking and eating; internalized motivation refers to the extent that people experience their behaviour as an expression of their personal values. From a theoretical perspective, the latter may be particularly relevant for understanding those consumers who care about the long-term implications of their food choices for nature, because their behaviour ('eating green') is the result of internalized motivation, which should be distinguished from the pleasure of cooking and eating itself. Internalization may arise from a concern about one's relationship with and responsibility towards nature, which is an important theme in modern culture (Taylor, 1989). In turn, fully internalized motivation can be distinguished from partial internalized ('introjected') motivation, which means that people have not fully accepted the personal importance of an activity for their own self-structures. Partial internalized motivation is, according to Vansteenkiste *et al*. (2005), a crucial factor in the maintenance of eating disorders where people are not able to establish an internalized balanced eating pattern, but feel pushed by internal pressures such as

Behaviour	Least self-determined	←		→	Most self-determined
Type of motivation	Amotivation	External motivation	Introjected motivation	Identified motivation	Intrinsic motivation
Motivational force	Helplessness	Expectations, rewards, punishments	Guilt, shame, internal compulsion	Personal values, commitment	Enjoyment, pleasure, interest
Locus of causality	Impersonal	External	External	Internal	Internal
Example of positive items in current study	Not included	*I like to take bargain offers in order to shop inexpensively.*	*Food is often an irresistible temptation. Sometimes I feel guilty about things I've eaten.*	*It's important to me that my food choices are not harmful to the natural environment.*	*I feel happy when I have time and attention to cook.*

Figure 1. Schematic overview of five types of motivation in self-determination theory (adapted from Vansteenkiste et al*., 2005).*

feelings of guilt and shame. This type of motivation is also quite different from external motivation, where people engage in an activity to obtain an external reward. Along these lines food can be perceived as fuel for the human body, which fits with buying food efficiently (in ways that save time and money), another important theme in modern culture (Taylor, 1989). Finally, there is the category of 'amotivation', which applies if people feel discouraged with regard to their behaviour and show a very low level of motivation. This type was not included in the present study.

Discussion

In this framework we have discussed different levels on which personal food choices can be understood. It is however not our intention to propose a matrix in which food choices can be analysed. The separate theories all emphasize polarities rather than distinct categories that people fall into. The perspectives can therefore not be combined easily, but they are meant to illuminate different motivational orientations underlying food choices. As we pointed out above, however, there are certain points of comparison. Taylor describes the utilitarian view as an understanding of nature that has no meaning beyond its function for humankind and a value that is only dependent on utility. This overlaps with the external type of motivation because personal values held by the individual do not influence her food choices. On the other hand, Taylor describes an emphasis on intuition and creative imagination, in which mankind is seen as an integral part of a larger order of living beings that sustains human life and fosters a kind of solidarity in the process of life. Food choices that reflect this orientation incorporate personal values held by the individual and can be described as internally motivated.

With regards to the promotion of sustainability relevant food choices, it seems that a value-driven perspective on food choices is generally beneficial, because it promotes a caring attitude towards food and nature. According to SDT, however, there might be an even more powerful motivational force of enjoyment, pleasure and interest in food (intrinsic motivation) that might currently be neglected. Thus, for instance, instead of pointing exclusively to the ethical benefits of eating less meat, it may be equally important to point to the pleasure and enjoyment that can be involved in exploring vegetarian cuisine.

The various types of motivation in combination with the cultural tensions discussed above, may have important implications for food sustainability in a pluralistic society. The framework proposed in this paper, takes into account that consumers have varying cultural orientations combined with different types of motivation for their food choices. Measures thereof will enrich the predictions and promotion of sustainability-relevant food choices.

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Food, sustainability and ecological responsibility: hunger as the negation of human rights

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Abstract

What will future generations think of our current lifestyle, of our unbridled consumption of food and energy and, on the other hand, our inexcusable degree of responsibility for hunger? How is it possible that we are now capable of producing enough food for all of humanity and that, at the same time, tens of thousands of people are allowed to die every day? Will we go lazily on shunning reality, submerged in passivity and oblivious to the havoc wreaked by virulent poverty? Undoubtedly periods of worsening crisis – ecological, environmental and economic- like the present, aside from their inherent and manifest negativity, represent a real opportunity to examine and question fundamental aspects of our growth model, as well as to revise ways of using natural resources and means of coexistence that have been in practice until now. For that reason the goal of the present talk is to deal with some of the key elements explaining and demonstrating the reasons for the unviability of the present model of development, while at the same time correcting the domination that has historically characterized western man's relationship to nature. Which, besides its seamlessly integrated progress, generates so much hunger and misery everywhere. So it is that the only dwelling suitable for hunger must be the museum of history, definitively forming part of an atavistic past, burdened down by inequality and a biting injustice. Nonetheless, to ensure that this proposal become effective, the problem has to be rethought, but beyond political and economic thinking, or eminently technical analysis chained to instrumental rationality. And thus, as J. Habermas insists, the suitable framework properly corresponds to the sphere of moral responsibility. And one of the unavoidable questions is 'How can we surpass the anthropocentrism of an ethics that excludes from the circle of its recipients mute nature and creatures capable of suffering, but who lack language'?

Keywords: poverty, malnutrition, globalization, solidarity

Introduction

The Nobel prize winner in Economy 2006, Muhammad Yunus, raises the question in this precise form: if poverty has neither been created nor generated by the poor, why should they have to either live it or suffer from it as if were a sentence that also forced them to live chained to it? For that reason poverty has to be considered, from any perspective, as the vilest negation of human rights. And an open and developed civilized society, that truly and coherently defends values like liberty, justice and dignity is inexcusably obliged to procure and authorize the adequate means for confronting it and obtaining its eradication (Sen, 1997).

That is why ending hunger in the world is probably one of the major challenges we face at the beginning of this millennium. Indeed hunger and malnutrition have progressively come to figure among the worst enemies of mankind. Nevertheless the data and statistics eloquently show that the hunger and poverty that ravages billions of people, initially have their deepest roots sunk in clearly identifiable factors. On the one hand, and from a proximate perspective, in a far from equitable distribution of resources and, secondly, in the present-day negative attitude towards proactively correcting these deficits with effective and united measures. For hunger is not a fatality nor an inevitable natural catastrophe that affects certain countries due to their particular geographical location.

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It is common knowledge, the Food and Agriculture Organization of the United Nations (FAO) informs us that enough food is produced today to satisfy the needs of 12 billion people, and nevertheless one in seven persons in the world suffers from chronic hunger and malnutrition (Dieterlen, 2003). Hence the interest in going further in seeking the deepest causes of this ignominious and gnawing reality that, besides burdening so many and shortening so many life expectancies, brings about the deaths of 24,000 people every day (Esquinas Alcázar, 2011).

Thus hunger, as well as the malnutrition and death it leads to, are in the end the result of a process in which factors of very diverse natures intervene: not only economic or commercial factors, exacerbated in recent years by the growth of globalization, or political factors, sometimes with dubious motivations, having less of an agricultural, or even demographic, character. All of these factors are fundamentally based on a development model whose roots are planted in a conception of the world that is not only anachronistic and outdated but essentially unjust, lacking in solidarity and, moreover, unliveable in terms of sustainability, as we shall detail here below.

New cosmovision and moral responsibility

It should be specified at the outset that man in our civilization has long since mislaid the horizon of his technical dominion over nature. And it also seems that he doesn't know what to do to get it back it. In fact, as M. Buber pointed out in 1942, one gets the impression that he is incapable 'of dominating the world he has created, that it turns out to be stronger than he is, and is emancipating itself and confronting him with an elementary independence – as if he had forgotten the formula that could recast the spell he once set in motion'.

We should always be aware that thought in no way remain alienated from the reality it thinks. That's why analysis and epistemological explanation of the facts continually and inherently involves a model, of action or interaction with a reality it can no longer remain alien to. For, as W. Benjamín lucidly forewarned us, 'the construction of life seems much more dominated by facts than by convictions'. Hence the need to realize that permanent dialogue, coupled with rigorous reflection on our anthropocentric understanding of the world cannot be postponed – concentrating mainly on the interpretation, application and intervention of this model. Being continuously aware too that the relationship and interrelationship of man and nature necessarily have to be founded within the incontrovertible ambit of ethical reflection.

This new cosmovision or conception of the world requires and demands a project and commitment to a moral reconstruction of society resulting, as Havel (2007) was well aware, in a responsible encounter of man with the world, with his surroundings, with his dwelling, lodging and protecting him since the birth of humanity. For it is obvious that the creature who repeatedly attempts to destroy his dwelling necessarily destroys himself at the same time. And just to avoid that progressive deterioration, we need to revise in-depth both the respective systems of ideas, beliefs and interests that underlie and nourish the ideology of process and development, and its goals and objectives. This alone will enable us to analyse and reveal its inherent limits and at the same time make us aware of the underlying moral implications and social consequences.

For, as V. Havel pointed out, in accordance with the thesis of J. Habermas, explained in 'Morality and Ethical Life. Problems of the Ethics of Speech', the fundamental problem is not specifically linked to science, nor incompassed within the orbit of technique either. We are rather dealing with problems related to the ambit of moral responsibility. This is because technological reason's development has eclipsed and, as a last resort, replaced practical reason, after having previously mortgaged it and, ultimately, watered it down.

Or else, what amounts to the same thing, the model of technical rationality that has prevailed for decades, and that has been erected as a paradigm of progress and development, is no longer is valid for being unsustainable. In addition, its inability has to be reviewed and corrected without further delay, together with its 'cosmovision' or underlying instrumental and strategic ideology. These respective orthodoxies have to be corrected without further ado. Probably in the last few decades, as V. Havel noticed, man has reached the frenzy of his operational and instrumental capacities. Through an exacerbated cultivation of reason, from a strict perspective, he has encumbered himself, and has come to believe himself to be a superior species of being and has in certain way played at being God. But as we can manifestly observe 'the game has avenged itself cruelly on him'.

It would be irrelevant to spend time now recalling the pre-industrial revolution period – which in certain way, and sometimes paradoxically, seems to be the unique and familiar stage in the life of mankind to have existed and survived the other systems of human values and principles that have governed relationships between man and his environment and neighbors, in other times, in other cultures and civilizations. In fact, the present-day model of development and coexistence are not the only ways of expressing the human condition nor necessarily the best ones. Historically, other models have existed in space and time, other experiences and references, and therefore it is easily conceivable that this modality of relationships is changeable and really can be modified.

Because, having arrived at this stage, the questions admit of no further delay. How has it happened that we have lost an ampler perspective and have simply, synchronously settled into a specialized model of rationality? Why, as Gandhi insisted, have we continued to consent that 'hunger be not only an insult, but in addition the most murderous form of violence that exists'?

The history of technique as techno-instrumental progress

It is quite probable that we have long been suffering the effects of having hypothesized a species of imperative by virtue of which 'everything that can technically be accomplished ought to be accomplished'. And as a correlate, we have advocated avoiding anything likely to affect, interfere with or prevent the path that has been elevated as the foundation of legitimation of this 'technological imperative' (Martinez, 1992).

That is to say, the problem – in principle epistemological – underlying the exhibition of the history of technique, considered from a strictly methodological perspective, leads us to our observing that this perspective is inadequate and liable to being clearly confounded by reality. Such an explanation tends to show the history of technique as a permanent succession of devices, neutrally guided by the criterion of efficiency. And according to that logic, this process necessarily generates progress, not only material or economic but also social, since this development and evolution of technique is able to overcome the needs and necessities nature originally imposed on us. And at the same time the process also, just inherently, creates wealth.

According to that explanatory model, technique, in its instrumental aspect, arises and develops as an historically autonomous dimension of human activity 'equipped with its own laws of development' and exclusively sustained by the principle of increasing the level of efficiency. Thus, bound to the idea of progress and the history of technique, a discourse clearly justifying the historical evolution of technique emerges and gains acceptance. Additionally, in a second phase technical progress is associated with economic growth and its translation into a progressive social welfare. To the point that the History of humanity is explained and even in most cases accepted as the history of humanity's progress, precisely 'as a function of techno-instrumental progress'. Thus being elevated to the rank of *the* unique, canonical interpretation.

What is decisive is that this logic prevails to such an extent that, in praxis, the history of technique has progressively been traded up as the key factor legitimizing western development, and ends up being accepted and imposed as the best of all possible models. Clearly the nucleus of the problem lies right here. This logic, impregnated with technical rationality and economic characteristics, impedes its own revision, rectification or the emergence of aporías or corrections, which rightly belong to application and evolution of all models.

In other words, this approach is obviously of an exclusive character and foments the autonomy of its own technique – if not its independence – by strategically averting our eyes and initiative, which it intends to integrate into an ampler context, less restrictive and more real. Hence the necessity of taking up, revising and finally reconstructing that history, which, as M. Foucault would say, has not been disclosed to us or dis-covered, but perversely hidden and ignored. And to do all this, we will have to extend the scope of our cosmovision, including, as an incontrovertible factor, the analysis and pursuit of the social contexts where it appeared and out of which it emerges.

Responsibility embodying solidarity

In other words, we need a new model or paradigm that includes new principles and factors such as: sustainable growth, risk evaluation, prevention of environmental impact, resource management, as well as the economic, ethical and social implications for the population and respect for life. And, furthermore, we must incorporate incontrovertible values like: responsibility, compromise, awareness and solidarity. Because otherwise, we will be forced to recall, with Cioran (1989) that 'We drift around and it's only someone drowns that he recognizes he's disposable. But then it's already too late to drown by free choice'.

So we need a new paradigm, a change of mentality and attitude with respect to our atavistic relationship, dominating and exploiting Nature. This new model has to be oriented and logically applied in another direction and from other presuppositions. And that decisive step can't be postponed. Finally, we have to elaborate a new conception of the world, more open, dynamic, less unilateral and mainly ecological, committed and embodying solidarity.

The sooner the better, we human beings must learn that it is impossible to govern the wind and rain, ignoring people's living conditions, wherever they happen to live. We speak out of the estrangement of a modern conception of solipsistic consciousness that has to be altered and replaced by an intersubjective consciousness, supported in a permanent horizontal relationship, of a character that is responsible, respectful and embodies solidarity. And if we consider the basic function of ethics to be, as Camps (1987) emphasizes, discovering this 'common interest', followed by a distance-taking and abandonment of sometimes ethnocentric, particularist positions or expectations, a first step will have been taken in assimilating and adopting this new universalist mentality.

We speak of obligatio in solidum, as De Lucas (1997) explicitly cites, in revindicating the reciprocal need to respect the development possibilities of all men, based in applying the principle of equality. For without solidarity it is impossible to promote or maintain a coexistence that is not *just* coexistence or that is *merely* reduced to coexistence: a horde that is composed solely of individuals aggregated or grouped together due to various factors, mainly interested in and frequently subsumed to economic motivations (Nussbaum and Sen, 1996)

That is the door opening onto the footpath advancing a new sensitivity in interpersonal relationships and contact with nature: a new form of awareness beyond the bonds of proximity. We speak in terms of responsible consciousness and about responsibility with a moral character. But this means no individual without intersubjectivity, impregnated with universality. In short, responsibility embodying solidarity.

Only in this way will it be possible to conceive and understand Nature in another way. Not as an object of exploitation, alien and far from us. We speak of Nature as a valuable and unquantifiable patrimony, ever more exploited, stripped and plundered; it demands and requires of all of us our full recognition of the duties we must assume with respect to it, and not only in the present but also, and especially, for future generations, in other words, for Humanity.

Nutritional sovereignty

As Amartya Sen warns us, it is only through the exercise of a positive liberty, yet based on minimal conditions, inescapable for survival, that individuals will subsequently be able to develop their autonomy, as well as their ability to do what they want to do in life – as well as seeking the adequate means for reaching those goals.

But to do this we unavoidably have to reassess the bases of negative liberty too, meaning a coordinated and committed facing up to all the factors that mortgage, burden and compromise the conditions necessary to reach a degree of development that dignifies human life. Even in knowing as Bobbio (2007) has clearly shown, that while equality is the dream of many, it has at the same time become 'the nightmare of a few'. A nightmare for those for whom 1.3% of their goods would eradicate hunger in the world.

Nevertheless, it is only by continuing in this direction that the neediest will advance furthest in 'embettering' the social bases of self respect. But to obtain this they need to recover minimal living standards that definitively banish the presence of hunger and the threat of death from their surroundings, whose unique place of residence ought to be in the indelible entrails of the past.

In the final analysis, and this is the main challenge, they need a type of basic, fundamental and irreplaceable sovereignty for survival: nutritional sovereignty (Esquinas Alcázar, 2011).

It is clear that this goal can only be reachable and viable once a drastic change in the paradigm has been brought about: an authentic metamorphosis in the weight of the technological-scientific model of development that is still in force and that has served as the basis for the prevalent increase in economic globalization.

We are referring to a model that, impregnated with economistic aspects, has hosted and colonized the lifestyle of the advanced and developed societies. A model that has underpinned the expansion of the new technologies and has generated high levels of international commercial exchange and well-being in certain Northern countries, but at the cost of the malaise of other peripheral countries, suffering the negative effects of globalization and its intervention – based as it is on the speculative economy.

Southern countries have traditionally been victims of the extraction of natural resources, the depletion of their seas and the lack of foodstuffs; with the conversion of those resources into commodities even generating biocombustibles, as well as a subsequent rise in food prices on a world-wide level. Countries whose farmers are expelled from their land lose their self-sufficiency capacities and are forced to emigrate to major cities, sometimes in far off countries.

In this respect, is not surprising that the UN's Special Rapporteur on the Right to food, Olivier de Schutter, has recently warned of the vital urgency of reaching consensual and committed decisions on the international level, and without further delay. For, in the final analysis, 'hunger is a political problem. It is a question of social justice and policies of redistribution'.

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Cultured meat: will it separate us from nature?

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Abstract

In vitro meat, or cultured meat, is one of the ideas that are being proposed to help solve the problems associated with the ever growing global meat consumption. The prospect is a source or great moral hope, but also generates doubts and criticism. In this paper, we focus on worries about (1) the alleged unnaturalness of *in vitro* meat; and (2) the possible deterioration of our relations with nature and animals. We will argue that arguments about (un)naturalness take us to any conclusion we want. As to our relations with nature and animals, we think it more plausible that cultured meat will lead to improvement than to deterioration.

Keywords: cultured meat, naturalness, environment, animal ethics

Problems of meat and potential advantages of cultured meat

Conventional meat production often involves intensive farming and is a source or increasing concern for severeal reasons. Animal welfare has been on the moral agenda since the nineteen seventies, but widely accepted solutions for the problems of intensive husbandry have not been forthcoming. Environmental impacts of livestock have been added to the agenda of concern through the publication of the FAO report 'Livestock's long shadow' (Steinfeld *et al*., 2006). Among other things, the report pointed out that livestock is responsible for approximately 18% of the total anthropogenic emitted greenhouse gases, which is more than the transport sector. Land use, water use, pollution and energy use are also matters of concern.To make matters worse, global demand for meat increases: it has doubled since 1970 and is projected to double again before 2050, in connection with the global rise in population as well as prosperity; when people get richer, meat consumption increases. At the same time there is widespread food insecurity in many parts of the world and starvation threatens regularly.

In the search for solutions, one idea is to produce meat (muscle tissue) from animal stem cells with tissue engineering techniques. The challenge is to select suitable cells from animals and make them proliferate in a bioreactor. The first feasible product will be minced meat. Fillet and other forms of vascularized may be the next goals.

Cultured meat has many potential advantages. First, the potential environmental gains are huge. Tuomisto and Teixeira de Mattos (2011) undertook a life cycle assessment, assuming that cyanobacteria are used as the source of nutrients and energy. They estimated that cultured meat involves 7-45% less energy than conventionally produced meat (only poultry has lower energy use), 78-96% lower emissions of greenhouse gases, 99% lower land use, and 82-96% lower water use. These figures indicate that cultured meat holds great environmental promise. For example, the dramatic reduction in land use opens the prospect that much of this land may be used for other purposes, such as arable farming and nature.

Second, no animals need to be kept and slaughtered. Though moral views on killing animals are divided (Cavalieri and Singer, 1994; McMahan, 2002), there is general consensus that suffering is an evil (DeGrazia, 1996). In so far as meat production causes suffering, cultured meat could replace these practices and thus lead to great moral improvements. In the future, meat might thus be produced partly

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as cultured meat, through tissue engineering, and partly through practices of raising animals that live good lives and are slaughtered in painless ways.

A third potential advantage is related to health. Many animal diseases have made it clear that meat from animals has its dangers. In cultured meat production, it will be easier to keep control of pathogen contamination.

Hopkins and Dacey (2008) have given an early overview of moral arguments for and against cultured meat. On the pro-side, they emphasized its animal friendly character. On the other hand, they noted and discussed many objections, such as potential danger and unfavourable first responses, but they found none of them convincing. (One of us briefly discussed some of their arguments in a previous paper; see Van der Weele, 2010). Hopkins and Dacey conclude that 'the development of cultured meat is not merely an interesting technological phenomenon, but something we may be morally required to support.' It is not yet possible to judge the real merits of cultured meat, as it does not yet exist, but we agree with the conclusion that research efforts should be encouraged from a moral point of view. Still, there are many open questions concerning the implementation and impacts of cultured meat in the future. In this paper, we discuss worries relating to nature and naturalness.

Cultured meat: natural or unnatural?

One of the counterarguments against cultured meat, also discussed by Hopkins and Dacey, is that it is 'unnatural'. They notice that on one hand this seems to be a primary objection for many people. On the other hand it can be regarded as an extremely weak argument because of well-known complications: nature is not synonymous with goodness, naturalness is hard to define, nature includes human intelligence etcetera.

Such complications are indeed notorious. The classic observation that what is natural is not necessarily good undermines the inherent moral force of naturalness. Further, the wide conceptual range in what 'natural' stands for makes it very variable what naturalness arguments amount to. For example: in the wide sense everything that exists is natural. In a more restricted form natural may mean something like 'not produced by humans'. But 'not produced by humans' as a characterization of naturalness will not do. Complications and exceptions keep popping up. Human children are natural, but what if they are born after *in vitro* fertilization? Surely such children are natural even if produced in a non-natural way? In the case of cultured meat, arguments can easily be given for its (relative) unnaturalness as well as its (relative) naturalness, as we will briefly illustrate.

Hopkins and Dacey end their brief discussion of naturalness by pointing out that is precisely the alleged 'unnaturalness' of cultured meat that makes it attractive: it may be 'superior to what nature offers – humans can live out their natural propensity to eat meat while also sparing animal from the horrors of that propensity.'

The 'naturalness' of cultured meat, on the other hand, was the subject of a small nocturnal competition we held at a recent meeting on cultured meat. The challenge was to argue that cultured meat is more natural than conventional meat. The jury chose two co-winning arguments. The first stated that in factory farming, animals lead such unnatural lives that cultured meat can only compare favourably:

'Arguably, the production of cultured meat is less unnatural than raising farm animals in intensive confinement systems, injecting them with synthetic hormones, and feeding them artificial diets made up of antibiotics and animal wastes. At the same time, the conventional production of meat has led to a number of unnatural problems, including high rates of ischemic heart disease and foodborne illness,

as well as soil and water pollution from farm animal wastes. If cultured meat is unnatural, it is so in the same way that bread, cheese, yogurt, and wine are unnatural. All involve processing ingredients derived from natural sources.' (Josh Balk; September 1, 2011)

The second winning argument states that tissue engineering is not as unnatural as we may think, because it closely resembles very natural processes:

'Life on Earth started with a single cell, a natural event. Our lives start with a single cell, undoubtedly very natural. Cultured meat originates from a single cell, just as the plants that we eat. Consumption of cultured meat is a very natural thing.' (Henk Haagsman, September 1, 2011).

As the examples illustrate, choosing a context of comparison is a crucial element with regard to naturalness arguments and their normative power. The arguments may take us anywhere we want to go; they lose their force exactly for that reason.

The abolition of nature?

More important than the naturalness of cultured meat may be the question what cultured meat means for our relations with nature. As we have seen, cultured meat is a hopeful development in at least some respects; think of the predictions of reduced land use, as estimated by Tuomisto and Teixeira de Mattos. But despite such hopeful prospects, the idea of cultured meat also generates worries about human relations with nature. Cultured meat fits in with an increasing dependence on technology, and the worry is that this comes with an ever greater estrangement form nature. Cultured meat, more specifically, might undermine our relations with animals. Are we, by turning to technology, evading the challenges in human-animal relations and giving up on animals?

In his book on sustainable forms of meat consumption, Simon Fairlie (2010) is an energetic spokesman for this worry. The book is set up as an argument against veganism: Fairlie argues that veganism is not the most convincing response to the problems of meat. Instead, he recommends eating very moderate amounts of sustainably produced meat.

Land use is a central topic in his book, and he tries to envision what a vegan landscape and a vegan future might look like. Vegans, he notes, have a strong tendency to resign from nature, to leave nature to its own and create a form of 'apartheid' between humanity and the natural world (*ibid*. 226). At a time when the organic sector is campaigning for slow food and real meat, vegans increasingly look 'in the very opposite direction': towards factory-produced processed forms of protein. And cultured meat, says Fairlie, 'is the dream product that lies at the end of this road'(*ibid*. 228).

In Fairlie's picture of future developments, cultured meat is very close to the genetic engineering of factory farmed livestock that is 'dumbed down' so that it could not feel pain. What we are witnessing might be 'the first signs of a convergence of interests between factory farming, veganism and genetic engineering.' Thinking further and including transhumanist prospects, Fairlie pictures a thoroughly technological vegan future, in which suffering is eradicated by biological engineering, and contacts with nature have come to an end. He warns that if we value our relations with nature and animals, the vegan agenda is not so innocuous as it might seem. A core danger is that the vegan detachment from the natural world would rob us from our own animal identity: 'we are what we eat, and by eating animals we help to ensure that we ourselves remain animals' (*ibid*. 231). This is a curious and hardly convincing argument, comparable to a claim that eating human meat will make us human.

Apparently, for Fairlie, in order to have valuable relations with nature we have to eat meat, a view that helps to explain why he thinks that a vegan future is a 'tragedy'. We will leave that appreciation for what it is. Instead, we focus on the question whether the prospect he sketches is a plausible one. Is it likely that cultured meat is part of a development that will put an end to our relations with nature in general, and with animals in particular?

We think the opposite is more plausible. To begin with, let us note that cultured meat is being developed to help solve the problems of the ever growing consumption of meat. These problems are not caused by vegans but by meat eaters, and the goal of cultured meat is thus not primarily to satisfy vegans, but to offer an alternative for meat eaters. A vegan view of the future is therefore not evidently the most relevant context for discussing cultured meat.

When we think about our relations with nature and animals in the context of meat consumption, there are good reasons to expect help from cultured meat.

With regard to nature in general, the prospect of large decreases in land and water use is extremely promising, as we noted before. As to farm animals: the goal of *in vitro* meat is to diminish the demand for conventional meat. If the decrease is sufficiently substantial, it might be possible to put an end to factory farming, replacing its products with cultured meat. The remaining modest demand for 'real' meat (by which we here mean meat from animals) could then be met by animals raised in animal friendly ways. This arrangement would put an end to the more 'unnatural' ways of raising animals, thus hugely improving our relations with animals. It might also free huge amounts of land that are now needed to grow animal feed. If part of that land were converted to new forests, for example, our relations with nature would also improve.

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Section 13. Consumers and consuming

Gender differences in pro-social behaviour: the case of Fair Trade food consumers

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Abstract

Objective of this paper is to analyse the presence of gender differences in the purchase motivations of Fair Trade (FT) food products sold in the Italian World Shops (WS). At the end of investigating FT purchase motivations, a questionnaire has been distributed to a sample of consumers in four Italian regions. A bivariate ordered probit analysis has been performed in order to identify the determinants of the two main ethical purchase motivations: worker guarantees and solidarity. The variables used as determinants are individual and municipal characteristics. Among individual characteristics, gender is significant; among the municipal characteristics, the rate of female labor force participation is also significant. These results give evidence of a gender-based differentiation in the preferences for FT public goods.

Keywords: consumption behaviour, ethical consumerism, purchase motivations

Introduction

The increasing interest of consumers in goods, which are purchased taking into account ethical considerations (Micheletti, 2003), has attracted the attention of many scholars in the last ten years. Consumers ask for solidarity to marginalised producers and for guarantees about the respect of labor standards, to the point of being less interested in traditional choice elements, such as conventional label and brand.

Understanding the determinants of the demand for goods which have been produced according to ethical considerations and marketed accordingly, has become an important research area in economics. Studies in this area tend to be mostly descriptive (Forno and Ceccarini, 2006; Lamb, 2007) and therefore they cannot properly identify the factors which drive the propensity to consume ethically produced goods, particularly, it is not clear what role the social environment plays in shaping the preferences for ethically produced goods. For example, the role of women's economic power, which has been traditionally important in promoting ethical consumerism (Terragni, 2007), has not been yet investigated.

Objective of this paper is to identify the determinants of pro-social behaviour by analysing the purchase motivations of Fair Trade (FT) food products sold in the specialized retailers called World Shops (WS).

In order to cope with this question, a questionnaire was distributed to a sample of 889 consumers in four Italian regions (780 useable cases), asking the purchase motivations of FT food products. Among the proposed motivations, two are ethical: worker guarantees and solidarity. In order to identify the determinants of this pro-social behaviour, the two ethical purchase motivations are the dependant variables of a bivariate ordered probit regression while the independent variables are individual and territorial characteristics.

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The questionnaire distribution and the variables

The questionnaire was distributed in four Italian regions: for budget constraints, it was initially distributed only in Emilia Romagna and Campania and, after a year, in Puglia and Calabria. The provinces chosen to carry out the study are those with the highest number of World Shops, where Fair Trade can be considered popular within the municipality. The respondents are generally WS customers but also occasional visitors.

The questionnaire is divided into sections concerning purchasing habits, relation with non-FT products, ethical activities, consumer socio-economic characteristics and purchase motivations. Through the Likert scale, respondents were asked to give a score from 1 to 5 to a series of purchase motivations, the two proposed pro-social motivations are the guarantees for worker conditions and the solidarity.

Among the socio-economic characteristics, respondents were asked to indicate the municipality where they live. Data on socio-economic conditions for the 130 municipalities indicated were gathered from several sources, mainly the Census, in order to characterize the environment were socially responsible consumers live and to identify which territorial conditions positively influence the diffusion of a pro-social behavior culture in the case-study examined.

The territorial determinants are investigated among demographic characteristics, economic conditions, women's economic power, social capital and cultural indicators. The demographic characteristics are population, present population over residents, density, living in an urbanized municipality (100 inh./kmq < density <500 inh./kmq), in a highly urbanized municipality (500 inh./kmq < density <1 ml inh./kmq) or in a metropolis (>1 ml inh.). Proxies of the economic conditions are the mean municipal income *pro-capita* and the unemployment rate while the women's economic power is represented by the female labour force participation, the female commuting rate and the divorce rate. The social capital indicators are the Senate voting rate, the number of non-profit organizations and the percentage of cooperative workers over the total workforce in the municipality. They should pick up the civic component *à la* Putnam (1993); as an additional indicator, we introduced the percentage of tax-payers who have chosen to donate the 5 per thousand of their taxes to municipal non-profit organizations. The cultural indicators refer to the municipal average of education years, the number of museums and the presence of a University.

Finally, we have also taken into account WS characteristics such as the presence of WSs in the municipality where the respondent lives, the distance between the municipality where the respondent lives and the municipality where the WS is located, the age of the WS where the respondent has been interviewed and its affiliation to the to the WSs' association (WSA) and to the main Italian FT importing channel (CTM).

The descriptive statistics of the variables have been here omitted for brevity.

The regression results

Among the motivations which can induce consumers to buy FT food goods, we focus on the two ethical purchase motivations, workers' guarantees and solidarity. We use a bivariate ordered probit when estimating the relationship between consumers' motivations to buy FT food goods and the independent variables. The main feature of the bivariate ordered probit is that it assumes that the two equations of interest are correlated in the residuals, which implies that common un-observables can explain the movements of the dependent variables.

What we are trying to explain is the contemporary presence of two strong ethical motivations in FT purchase, however, this does not automatically imply a much higher willingness to pay for ethical attributes.

Table 1 shows the results of the bivariate ordered probit regression. The number of observations reduces to 780 for the presence of missing values or of customers not buying FT food products. The fit of the regression is good since the variables are jointly significant, as it is possible to judge from the value of the Wald test. The bivariate specification is supported by the data since the value of the correlation coefficient between the two equation errors is high (0.56) and statistically significant, as shown from the Wald test result. The standard errors, not reported in the table, are robust because have been clustered at the municipality level.

The coefficients of the variables in an ordered probit model have no immediate interpretation. However, the significance of the coefficients can be useful as it gives a first idea of the relative importance of the independent variables in explaining our dependent variables.

It is interesting to observe that the determinants of the two ethical motivations differ.

Among the individual determinants, the only variable to be significant is education. The gender dummy, which is 1 when the respondent is a man, is not significant for the worker guarantee motivation and is weakly significant for the solidarity motivation. The variables income and age were not significant and omitted in the specification presented here in order to increase the number of observations because of missing values.

Table 2 reports the marginal effects for the event that the respondent has given the maximum score to both the ethical motivations. The gender variable is significant and with a negative sign, meaning the existence of a gender gap in the preferences for FT food goods.

This result has already been acquired by the literature as women tend to have stronger preferences for FT products (Lamb, 2007; Loureiro and Lotade, 2005) and, generally, for this kind of public goods (Aid *et al*., 2006; Zelezny *et al*., 2000). The result is reinforced by the positive and significant effect of the female labour force participation and by the negative and significant effect of both the divorce rate and the female commuting rate: a stronger female economic power in the municipality seems to be favorable to FT pro-social behavior and conducive to the socially responsible values channeled through FT purchase. This result seems to confirm the existence of an income effect in gender-based differentiated preferences for FT public goods (Carlsson *et al.*, 2010) which acts not directly (income is not significant) but indirectly: the female economic power in a municipality influences the FT ethical motivation diffusion.

The impact of the municipal average of education years is much stronger than the number of education years of the respondent: one year of further education has a marginal effect of 0.15 for the municipal variable and a marginal effect of 0.01 for the individual variable (the correlation between the two is very low).

Among the social capital determinants, the traditional indicators of the civic sense, such as the Senate voting rate, do not display the expected impact, since socially responsible consumers do not trust in the politicians, or are not significant, in the case of the non-profit organizations presence. Instead, the presence of cooperative workers, over the municipal total workforce, displays a significant impact with a marginal effect equal to 0.12.

Table 1. Bivariate ordered probit results. Dependant variables the ethical purchase motivations.

Independent variables	Workers' guarantees		Solidarity	
	Coef.	z	Coef.	z
Dependent variable				
Population	0.01	3.75***	0.00	2.01**
Present pop./residents (%)	-0.03	-0.73	-0.14	-2.92***
Female commuting rate (%)	-0.20	-4.71***	-0.04	-0.92
Female labour force participation (%)	0.23	5.47***	0.08	1.79*
Density	0.00	-1.79*	0.00	-0.57
Divorce rate (%)	-0.20	-2.21**	-0.30	-3.63***
Gender	-0.17	-1.47	-0.16	-1.79*
Unemployment rate (%)	0.09	4.2***	0.05	2.14**
WS customers of the same municipality (%)	0.00	-0.92	0.00	1.97**
Distance fom the WS	0.00	2.13**	0.00	-1.14
Mean municipal income	-0.18	-3.18***	0.04	0.64
Senate voting rate (%)	-0.04	-2.15**	-0.04	-2.2**
Non-profit organizations	-0.20	-1.26	0.07	0.52
Non-profit org. taxes donation (%)	0.00	0.17	-0.05	-1.63*
Cooperative workers on total workforce (%)	0.02	0.17	0.47	2.89***
Museums	-0.22	-2.45***	-0.05	-0.9
Individual education years	0.03	2.51***	0.03	2.54***
Mean municipal education years	0.66	3.42***	0.24	1.53
WS age	0.03	1.30	0.01	0.23
WS presence dummy	-0.25	-1.59	-0.21	-1.4
University dummy	-0.10	-0.47	0.19	1.11
Puglia dummy	2.32	2.81***	-1.02	-1.29
Emilia Romagna dummy	-0.49	-0.77	-0.96	-1.88*
Campania dummy	0.95	1.26	-1.23	-2.02**
Calabria dummy	1.46	1.56	-1.26	-1.35
Year dummy	-1.68	-3.3***	-0.28	-0.52
CTM dummy	-0.08	-0.57	0.08	0.58
WSA dummy	0.17	1.02	0.04	0.23
Urbanized municipality dummy	1.95	4.55***	1.37	3.51***
Highly urbanized municipality dummy	2.11	4.56***	1.47	3.50***
Metropolis dummy	-4.43	-2.58***	-2.78	-1.92*
Number of obs.	780			
LogL	-1,102.95			
Wald test of joint signif. chi2(31)	412.48			
Rho	0.56	14.14***		
Wald test of indep. eqns. chi2(1)	119.09			

*** significant at 1% level; **significant at 5%; * significant at 10%.

Table 2. Marginal effects for the outcome (5, 5): y = 0.67.

Independent variables	dy/dx	z
Population	0.002	3.36***
Present pop./residents (%)	-0.04	-2.37**
Female commuting rate (%)	-0.04	-2.57***
Female labour force participation (%)	0.05	3.65***
Density	0.00	-1.32
Divorce rate (%)	-0.10	-3.62***
Gender	-0.06	-1.97**
Unemplyment rate (%)	0.03	3.3***
WS customers of the same municipality (%)	0.00	1.47
Distance fom the WS	0.00	0.42
Mean municipal income	-0.02	-0.97
Senate voting rate (%)	-0.02	-2.46***
Non-profit organizations	-0.01	-0.25
Non-profit org. tax-payer donations (%)	-0.01	-1.37
Cooperative workers on the total workforce (%)	0.12	2.51***
Museums	-0.05	-2.13**
Individual education years	0.01	3.72***
Mean municipal education years	0.15	2.71***
WS age	0.01	0.62
WS presence dummy	-0.08	-1.78*
University dummy	0.03	0.55
Puglia dummy	0.09	0.33
Emilia Romagna dummy	-0.32	-1.65*
Campania dummy	-0.27	-1.18
Calabria dummy	-0.38	-1.18
Year dummy	-0.33	-2.48***
CTM dummy	0.01	0.11
WSA dummy	0.03	0.56
Urbanized municipality dummy	0.55	5.4***
Highly urbanized municipality dummy	0.61	5.66***
Metropolis dummy	-0.73	-28.8***

*** significant at 1% level; ** significant at 5%; * significant at 10%.

The main deterrent of the pro-social behavior, channeled through FT purchase, is congestion: living in a metropolis has a marginal effect equal to -0.75 while living in a municipality which is medium or highly urbanized seems to facilitate social interactions, in any case there is evidence of scale economy in the diffusion of FT socially responsible values since the population variable is significant.

In conclusion, among individual characteristics, gender and education have significant marginal effects for the event that the two ethical motivations gain contemporary the highest scores; among the municipal characteristics, living in a highly urbanized and in an urbanized municipality, the mean education level and the percentage of cooperative workers on the total workforce display the strongest positive marginal

effect, followed by the female labour force participation. In a decreasing order, living in a metropolis, the divorce rate and the female commuting rate display the strongest negative and significant marginal effect.

Concluding remarks

Objective of this paper is to identify the pro-social determinants in the purchase motivations of Fair Trade (FT) food products sold in the Italian World Shops (WS). At this end, a questionnaire has been distributed to a sample of consumers in four Italian regions. A bivariate ordered probit analysis has been performed on the two main ethical purchase motivations: worker guarantees and solidarity. The variables used as determinants are individual and municipal characteristics.

Among individual characteristics, education and gender are significant as women are more motivated by worker guarantees and solidarity in FT purchase; among the municipal characteristics, the factors, which explain stronger worker guarantee and solidarity motivations in FT purchase, relate to living in a highly urbanized but not congested municipality, with a high mean education level, a cooperative culture and a strong female economic power. These results give evidence of a gender-based differentiation in the preferences for FT public goods.

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Employing a normative conception of sustainability to reason and specify green consumerism

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Abstract

Two common objections against moral arguments claiming the necessity of individual changes in food consumption encompass first, that the relation between these choices and the predicted harm is indirect and second, that such claims infringe on the individual's freedom of choice in a way that qualifies as unjust. This paper aims to discuss the contribution of a normative conception of sustainability in rebutting these objections and thus reasoning a moral argument asking for green food consumption.

Keywords: justice, sustainable lifestyles, food consumption

Introduction

Two common objections against moral arguments claiming the necessity of individual changes in food consumption encompass first, that the relation between these choices and the predicted harm is indirect and second, that such claims infringe on the individual's freedom of choice in a way that qualifies as unjust. This paper aims to discuss the contribution of a normative conception of sustainability in rebutting these objections and thus reasoning a moral argument asking for green food consumption.

To this end section 1 outlines a conception of sustainable development (SD). Section 2 discusses how far this conception can contribute to rebut the given objections. Finally, section 3 investigates the implications of the above discussion regarding policy measures aiming to enable and advance green consumerism.

Conceptualizing sustainable development

In 1987, the World Commission on Environment and Development defined SD as development 'that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987: 43). I will focus on two issues here: first, the definition specifies SD as encompassing issues of justice towards contemporary *and* future humans – that is, inter- *and* intragenerational justice. Second, the definition conceptualizes the claim for SD as contradictory: the aim to achieve a decent quality of life for contemporary humans potentially threatens the possibilities to achieve a decent quality of life for future humans (Christen and Schmidt, 2011).

The latter means, that one characteristic about the sustainability discourse is that it expounds the problems of the circumstances under which claims for inter- and intragenerational justice are raised. Accordingly, I hold that specifying SD necessitates an explication of the character of the world ('Beschaffenheit der Welt'), in which claims for intra- and intergenerational justice have to be achieved. Accordingly, I distinguish two dimensions of a concept of SD. (*ibid.*) I will coin these two dimensions as 'justice' and 'the circumstances of sustainability' (Muraca and Voget-Kleschin, 2011).

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Specifying the dimension of justice

Specifying the first dimension means specifying what contemporary and future recipients of justice can legitimately claim in terms of justice. That is, a conception of SD needs to specify (Muraca and Voget-Kleschin, 2011):

- Who counts as legitimate recipient of justice (scope of justice): This concerns the identification of beings that qualify as legitimate recipients of benefits and burdens. I will argue from an anthropocentric position here, albeit a weak or deep anthropocentrism. (cf. Muraca, 2011).
- Which benefits and burdens are covered by a conception of SD (informational focus or currency of justice): I will draw on the capability approach (CA) as an informational focus of justice here. The CA argues that the decisive feature regarding human quality of life is not the amount of resources a human being has access to but rather, what (s)he is able to do and to be. Furthermore, because the CA puts central importance to humans ability to choose what (s)he values and has reason to value, rather than focusing on actual beings and doings, the CA argues that evaluating human quality of life should focus on a person's capabilities, that is, on his or her ability to achieve beings and doings (s)he has reason to value. (Nussbaum, 2007; Sen, 2009).
- According to which pattern these benefits and burdens should be distributed (pattern of justice): Here I will draw on an absolute (or sufficientarian) standard of justice. That is, I assume that (at least in terms of those issues of justice that are covered by a conception of sustainability) claims of justice are satisfied if everyone has enough, that is, if everyone's capability set exceeds an absolute standard.

Specifying the circumstances of sustainability

Specifying the circumstances under which claims for intra- and intergenerational justice have to be achieved, necessitates referring to those circumstances that are of importance for individuals' quality of life. Hence, it first of all necessitates an account of how human wellbeing or quality of life comes about and what circumstances are necessary for achieving a quality of life that exceeds an absolute standard. To do so, I will once again draw on the CA.

First, the CA conceptualizes human beings as being able to convert resources into functionings. Furthermore, it argues that humans' ability to convert resources into functionings differs, depending on personal heterogeneities, social and environmental circumstances (Robeyns, 2005). That is, the CA acknowledges human's dependence on what I will call natural and social capital respectively here. Second, the notion of (negative) feedbacks of human behavior on (natural) capital is both starting point and a matter of course in the sustainability debate. Recently, different scholars proposed to integrate such 'feed-back-loops' of human behavior on the (natural) base of livelihood into the capability approach (cf. (Christen *et al*., 2011).

Action guiding potential of a conception of sustainability: the case of green consumerism

Countering the objection that the (causal) relation between these lifestyle-choices and predicted harm does not suffice to reason claims for lifestyle-changes

A common argument against claims for green consumerism and sustainable lifestyles argues that the (causal) relation between lifestyle choices of individuals in industrialized countries and harmful consequences is too weak to reason such claims. This argument can be differentiated into claims that the predicted harm:

1. won't directly affect a specific individual or group but causes indirect effects;
2. will occur in the long run only;

3. will only occur with a certain likeliness/ probability; and/or
4. cannot be assigned to individuals but rather results from collective action.

Ad 1) This claim can be countered by pointing to the importance given to the dimension of the circumstances of sustainability in the concept of sustainability. Specifying the different building blocks of this dimension does allow identifying both how individual lifestyle choices affect natural (and social) capital as well as how the deterioration of the different types of capital harms (other) individuals. Thus even though the effects on contemporary and future human beings are not direct, they can nevertheless be sufficiently linked to lifestyle-choices so as to reason addressing these lifestyle choices.

Ad 2) If one takes the notion of obligations towards future generations that forms a constitutive feature of a normative theory of sustainability seriously, the argument that negative effects will occur in the long run only does – if anything – allow for discounting these consequences but not to abandon them completely.

Ad 3) This argument points to the notion of the precautionary principle. The precautionary principle claims that if an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is not harmful falls on those taking the action (cf. Jonas, 1984). That is, even if the negative consequences of certain lifestyle choices will only occur with a certain probability, it may nevertheless be legitimate to constrain these choices.

Ad 4) Seldom will it be the decision of a specific individual to live its life according to his or her ideas of what constitutes a good life that results in harmful consequences. In contrast, harmful consequences will mostly result from collective action. Thus it could be said that if it is not possible to link specific lifestyle choices with specific harmful consequences, it is therefore not possible to characterize specific lifestyle choices as unsustainable and it is thus impossible to differentiate less and more sustainable lifestyles. A possible reply to this argument consists in the proposal to characterize those lifestyle choices as unsustainable that would lead to unsustainable consequences if they were taken by everyone. (generalization argument, cf. Singer, 1971).

This discussion has not yet given a convincing argument for green consumerism. What it has achieved however is outlining which aspects one would need to address to develop such an argument. These refer most prominently to demarcating which aspects of nature are necessary constituents of human wellbeing and thus qualify as integral aspects of natural capital, and in demonstrating how human (food) consumption causes negative feedbacks on this natural capital. This would then allow evaluating food consumption choices as more or less sustainable. Specifying such an argument goes beyond the scope of this paper. In the remainder of the paper I will therefore just assume certain characteristics of (more) sustainable food consumption. Specifically, I will draw on the assumption that sustainable food consumption is characterized by (cf. Voget-Kleschin, 2012):

- a low share of animal products (i.e. meat, dairy, eggs) in overall food consumption;
- a certain share of regional and seasonal products;
- taking into account the social side of food production and consumption.

Countering the objection that claiming green consumerism infringes on the individual's freedom of choice

The CA conceptualizes the capability set of individuals as depending on the amount of goods an individual has at his or her disposal as well as on personal heterogeneities, social and natural capital (see above). Having access to a certain capability set, individuals are then able to make decisions. These decisions regard *which* beings and doings individuals want to achieve. By way of example, an

individual can have the capability to be adequately nourished but can still decide to fast. Furthermore, individuals are able to decide *how* to achieve functionings. Thus, an individual who has the capability to be adequately nourished can achieve this functioning in various ways. She or he can decide to eat more or less fast food, more or less meat or animal products, more or less sugar, fat, and protein, etc.

As was discussed above, the way in which an individual aims at achieving a particular functioning results in feedbacks to natural (and social) capital. In the following, I will denominate the individual`s decision as to which functionings to achieve and how to achieve them as the lifestyle of the individual. Sufficiency understood as asking for a sustainable lifestyle thus means asking for lifestyles that reduce negative feedbacks on natural (and social) capital and that utilize natural capital to a lesser extent. Here I will assume that negative feedbacks result primarily from the production and consumption of goods. The description now suffices to distinguish three different starting points for sustainable lifestyles. These encompass:

1. Changing the capability set: Firstly, it is possible to change the capability set. Thus, for example, the state can take measures so as to increase the price of certain goods or even ban certain goods on account of their negative environmental footprint. By way of example, the state could levy additional taxes on meat on account of the negative environmental consequences of meat production especially regarding its GHG-emissions.
2. Improving social capital: A second approach consists in changing the amount of goods individuals have access to, while simultaneously improving social capital. The reduction of available goods will therefore be complemented by the improvement of social capital, thus allowing to maintain the original capability set. Drawing on the example given above, the state could accompany its levy on meat by introducing cooking classes in schools, enabling students to create tasty vegetarian dishes.
3. Changing choice: A third possibility consists in individuals changing their choices. In terms of the example of meat consumption, this means that individuals could voluntarily reduce their meat consumption on their own accord.

A common objection against claims for sustainable lifestyles argues that they infringe on the individual's freedom of choice in a way that qualifies as unjust. This means that such claims overburden the individual to a degree that results in a violation of rules of justice as they apply to the individual addressed by the claims. How far does this argument hold in regard to the three approaches towards sustainable lifestyles outlined above?

Ad 1) Ceteris paribus, that is, without further changes in the other influencing factors, most notably social capital, a reduction of access to goods will lead to a diminishment/degradation of a person's capability set. Above, I argued for an absolute standard in regard to the pattern of sustainability. Taking the absolute standard seriously means that such a diminishment/degradation of a person's capability set may be legitimate as long as her or his capability set still exceeds the absolute standard.

Ad 2) This approach assumes that it is possible to substitute access to certain goods and services by improving social capital. By way of example, it was assumed that reducing individuals' access to meat can be substituted for by enabling her or him to cook a tasty vegetarian meal. Supposing that this allows students to enjoy vegetarian meals as much as they enjoyed non-vegetarian meals before, one could argue that even though the amount of goods (in this case, meat) an individual draws on has been reduced, improving social capital (that is, the ability to cook a tasty vegetarian meal) has substituted for access to goods, leaving the capability to enjoy tasty food undiminished. The CA argues that human wellbeing should not be evaluated in terms of access to goods but rather in terms of access to a certain capability set. Assuming the capability set exceeded the absolute standard of justice before the measure was implemented, means it still exceeds the absolute standard after the measure has been implemented. Accordingly, such changes should be deemed acceptable as well.

Ad 3) This approach is what is typically associated with sufficiency. It is often linked to notions of individual restraint and thus given a negative connotation. In contrast, proponents of sufficiency do not disagree with the necessity for a certain degree of (material) simplicity but point to possible positive (side-)effects. In regard to meat consumption, arguments may for example point to accompanying health benefits. However, in a liberal state individual lifestyle choices are seen as a private decision with which the state should not interfere. This goes in hand with the CA's strong emphasis on individual's freedom to live a life (s)he values and has reason to value. Accordingly, the third approach to sustainable lifestyles is assigned to the realm of private decisions in which the state should not interfere.

This discussion showed that while a conception of sustainability as outlined above assigns great importance to individual freedom of choice, it nevertheless allows arguing in favor of certain political measures that explicitly aim to nudge individuals towards (more) sustainable lifestyles. That is, the conception of sustainability as outlined above allows rebutting the claim that any measures aiming at the implementation of sustainable lifestyles necessarily infringes on the individual`s freedom of choice. Furthermore, it allows distinguishing different approaches towards sustainability and evaluating if and how far these can be conceived of as legitimate.

Specifying green food consumption

In a previous section I proposed to characterize sustainable food consumption by a low share in animal products, a certain share in regional and seasonal products and by taking social issues into account as well. This most certainly means that sustainable food consumption cannot be reduced to substituting a less sustainably produced item of food (such as conventionally produced meat) with a more sustainable produced item of food (such as meat produced according to standards of organic agriculture). It rather means changing the general consumption behavior in regard to food. However, this necessitates changing shopping, cooking and eating habits and thus draws on individual knowledge and time and is possibly also more expensive. (Voget-Kleschin, 2012) However, most people don't have the impression that they have access to idle time or money. This means that if they invest more time and money in food, it will lack somewhere else. This in turn means that sustainable food consumption cannot be isolated from other aspects of the person's lifestyle but also from the institutional frame (social values and norms, legal and organization structures, power relations, etc.) in which an individual takes lifestyle decisions. (Seyfang, 2011)

What does this imply regarding political measures aiming to nudge individuals to more sustainable food consumption? The following account does not aim at developing detailed policy advise, but rather at demonstrating how the different approaches towards sustainable lifestyles outlined above can be fruitfully employed to specify the claim for sustainable food consumption.

Ad 1) This encompasses measures that contribute to a more sustainable food production, such as environmental advice for farmers regarding compliance with EU Cross Compliance, levies on nitrogen and pesticides or mandatory spatial intervals towards water bodies and other sensitive ecosystems. (SRU, 2008) Assigning these measures to the realm of sustainable lifestyles is reasoned by the fact that from the consumer's perspective they will primarily result in higher prices for food products. Such prices are legitimate insofar as they do not push individuals beyond the absolute standard of justice. On average, German consumers spend about 12.5% of their income on food (not including tobacco and alcohol). Thus a moderate price increase seems fairly acceptable.

Ad 2) Insofar as sustainable food consumption necessitates knowledge and skills, (formal and informal) education can enable individuals to take up (more) sustainable food consumption patterns. However, complementing measures aiming at more sustainable food production with measures aiming at increasing

or enhancing social capital goes way beyond education. As discussed, sustainable food consumption necessitates not only knowledge and skills but also time (for shopping and cooking). Assuming a similar relation – that is, more sustainable habits necessitating more time or other rhythms – holds for other aspects of sustainable lifestyles as well (cf. Reisch, 2001), demonstrates that enabling sustainable lifestyles can benefit from if not even necessitate different societal patterns of dealing with and conceiving of time and work. (*ibid.*)

Ad 3) As discussed, a liberal state should not directly interfere with individual lifestyle decisions. However, this does still leave room for political measures that advance and enable sustainable consumption decisions. This holds for establishing and advancing supply of sustainably produced food items. Both organically produced as well as fair trade products are by now widely available in most supermarkets. However, this is not yet reality regarding regional and seasonal produce. Furthermore, there is still room for advancing supply of (more) sustainably produced food in catering. Finally, sustainable food consumption necessitates labeling of relevant features such as GHG-emissions and mode and distance of transport as well as inhibiting misleading labeling.

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Are we morally obliged to become vegans?

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Abstract

The ecological footprint is, among other things, influenced by nutrition styles. Especially western diets with their high intake of meat, dairy products and eggs produce large amounts of greenhouse gases. Different analyses show that from an ecological point of view a vegan diet overruns a vegetarian or a meet-based diet by far and in all respects. However, diet choices are generally considered to be a wholly private matter. The paper claims that this assumption presupposes some conditions, which arguably do not hold. Namely, that eating is unproblematic. Yet, depending on what one eats one contributes to a different extent to global warming and one's diet turns out to be either more or less harmful for the climate. Undeniably, it is only the aggregated effect of human actions that generates climate harm, actions related to food consumption being among them. But this merely shows that the individual impact is inscrutable without being unreal. Animal products should be given special attention when evaluating different strategies to live more climate friendly because they all emit large amounts of methane and nitrous oxide. This makes going vegan not imperative, but shows it to be a very promising strategy for individually contributing to a better climate.

Keywords: climate ethics, ethical consumerism, environmentally friendly food choices, individual duty

Do my food choices matter?

Climate change and the consequences of global warming is one of the defining challenges of the 21st century. In order to meet this challenge, global emissions of greenhouse gases, henceforth GHG, must be reduced drastically. According to a widespread opinion, global emissions should reach their climax by 2015 and then gradually sink by 50% (Rahmstorf and Schellnhuber, 2006) or even by 80% (Lynas, 2008) until 2050. Whatever reductions are necessary, the following question must be addressed from an ethical point of view: Does climate change require a moral reaction from us individuals? Does each of us have the moral duty to enact against it and, for example, reconsider and even alter one's lifestyle in order to reduce emissions?

It may seem intuitive to assume that individuals should be morally obliged to live in a climate friendly manner. But can this intuition be corroborated? How do we argue the point that the claim has a normative impact? Especially when food choices are at stake, disapproving reactions seem foreseeable. Many believe their diets to be an entirely private matter, meaning thereby that any criticism of it is inappropriate and moral reasoning cannot really question their liberty of choice. This obviously contradicts the first intuition and seems to indicate that climate friendly styles of living and eating may be at the most admirable, but not an individual moral duty. Claims to the contrary appear to be the sign of an overdrawn moralization. The paper examines the question if the tensions between these two opposite intuitions can be resolved in favour of a moral duty to eat climate friendly and thereby rejecting what I would like to call 'the private matter stance regarding our food choices'.

'Foodprints' on the ecological footprint

The impact of nutrition on climate and the environment is well documented (see e.g. Schlatzer 2010). Different studies estimate that 31% of all GHG produced in an average German household are related to food consumption (Tukker and Jansen, 2006). Eating generally produces more GHG than individual

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mobility. This is basically related to the high intake of processed meat, dairy products and eggs, typical for the so-called western diet, which many of us live. Animal products are known to produce large amounts of GHG, namely 18% of the global emissions (FAO, 2006). Other studies estimate that their impact is even larger and amounts up to 51% (WorldWatch 2009). Especially emissions of methane (37%) and nitrous oxide (65%) by livestock, two extremely potent GHGs, are considerable (FAO, 2006).

By eliminating animal products from one's plate or substituting them by plant-based alternatives one could reduce the individual carbon footprint. In order to illustrate this point, some animal products and possible alternatives to them are compared in Table 1, relatively to their CO_2-equivalents per kilo (CO_2-Eq./kg).

This selection of products is, of course, not exhaustive and it may be questioned if soya granulate and the other vegan products really are adequate substitutes for their animal-based counterparts. However, I would like to leave this point aside. The figures clearly indicate that GHG emissions of plant-based products are in general lower than those of their non-vegan counter-parts. By simply opting for a plant-based version one could reduce emissions without having to change one's nutrition style any further. If one additionally prefers ecological and local fresh food produced within season and refuses to eat large amounts of processed vegan products, the possible GHG reductions are even more substantial. A vegan diet is then the most climate friendly lifestyle (Von Koerber and Kretschmer, 2009) and it can reduce at least up to two thirds or more of GHG of an ordinary western diet and one third compared to a vegetarian diet (see e.g. Foodwatch, 2008). It is therefore not very surprising that in recent years, plant-based diets have been promoted for their climate friendly impact (see e.g GV-nachhaltigkeit) and we may ask, if everyone should go vegan for climate ethical reasons.

Even though the empirical data are clear enough, the very claim to eat climate friendly nevertheless seems to lack a normative impact. First, it is unclear if climate change really actually imposes individual duties such as reducing GHG emissions. Second, even if it does, it must be argued that food choices are a reasonable or even an especially interesting strategy for doing so. Both reservations independently corroborate the intuition that eating is a private matter. In order to confront these two objections one therefore has to argue that living climate friendly is a moral duty and show this duty to apply to food choices, too.

Go vegan: individual moral duties at stake

The impact of nutrition on the carbon footprint is considerable. Yet, it is only the aggregate effect of many actions performed by many individuals that lead to the harming consequences of climate change. Even though food choices contribute to these negative effects, it is not the diet of a single person or

Table 1. CO_2-equivalents for animal products and possible vegan alternatives (www.eaternity.ch and SERI).

Animal products	CO_2-eq./kg (g)	Vegan products	CO_2-eq./kg (g)
Mincemeat	8,300	soya granulate	830
Butter	23,800	margarine	752
Cheese burger	8,490	vegan burger	1,600
Milk	935	soya milk	600
Chicken	3,470	tofu	1,700
Pig	3,240	seitan	500

her lifestyle that brings about the harm. If somebody decides to eat more climate friendly, this will not prevent climate change from proceeding (Glover, 1975; Johnson, 2003; Sinnott-Armstrong, 2009). Therefore it becomes difficult (Jamieson, 2007, Schwartz, 2010) or simply mistaken (Johnson, 2003, Sinnott-Armstrong, 2005, 2009) to attribute individual duties on moral grounds. Individual choices don't make enough difference to corroborate the demand to withhold from them because of their harmful effects on the climate (Kutz, 2000).

This type of criticism of individual duties assumes that the possibility of ascribing them depends on the following two conditions: Either one can identify the individual's role in bringing about a harmful consequence or one can show the individual's actions to be effective when it comes to preventing harm. Eventual duties depend on the causal role of individual actions or their effectiveness to combat a problem. Given the phenomenon of climate change and the role of individual actions in it, both conditions seem not to hold. One can still claim that individuals should engage in collective actions preventing climate change from happening and support, e.g. institutions that implement the necessary measures (Fahlquist, 2009; Johnson, 2003; Sinnott-Armstrong, 2005). But such duties are clearly related to collective or institutional duties to take action against climate change and it does not follow from these that one should individually and unilaterally reduce GHG emissions. If no individual duties to reduce GHG emissions can be argued for, there are no duties to eat climate friendly either, at least until collectives or institutions force us to do so.

There are different strategies at hand to confront this problem: First, one may try to show that individual actions do have harmful effects, despite impressions to the contrary (e.g. Nolt, 2011; Parfit, 1984) or reason that any preventable GHG emissions simply are morally bad (Johnson, 2011), e.g. by referring to green virtues (e.g. Jamieson, 2007) or something alike and claiming that these hold especially when little is at stake for a person (Fahlquist, 2009). The first strategy faces some problems because one not only has to show the impact of an individual's actions such as the additional amount of GHG in the atmosphere, but prove them to be harmful (Sandler, 2011). If successful, however, the private matter claim is certainly off the stove. Referring to green virtues is certainly a very promising strategy, but normally provokes rather sceptical reactions from all those who have no interest in green issues.

The case for individual duties

The question what effect an action has and which strategies to confront a problem are successful are primarily empirical questions. Independently of the theoretical framework one favours, it certainly is reasonable to consider the effects of an action and evaluate its impact when it comes to overcome a problem. Individual actions have incontestably a moderate effect on climate change and abstaining from them will not guarantee it will come to an end. If, however, one makes the additional counterfactual assumption that others continue to emit the same amounts of GHG as they do today or that they will try for whatever reason to reduce their GHG emissions more or less substantially, it is certainly correct to assume that the effects will be different. The counterfactual assumption merely points out that in combination with other people, individuals can make a difference. No opponent of individual duties would want to challenge this claim. But unlike to what he holds, this additional assumption helps to underline the individual's causal role. Of course, the effects are only perceivable in combination with the actions of many others. This, however, merely demonstrates that the individual's contributions are inscrutable because of the complexity of the phenomena that lead to the harmful effects without denying that they are real and causally efficient. And all GHG emissions will have harmful effects if they are not restricted very soon. The argument seems so provide enough of a basis to claim that individual duties hold and independently of what others actually do.

Parfit (1984) introduced the concept of imperceptible effects to argue that each participant in a collective wrongdoing does in fact make a difference to overall consequences. Because of this effect, he claims, one can argue in favour of individual duties. In our case this would mean a duty to restrain from emitting harmful GHG. Of course, the positive effects will only be perceivable if more than a few take their duty seriously and restrain from causing imperceptible harms. But this merely shows that individual duties should not be limited to improve one's personal carbon footprint, but one should additionally assume a duty to invite others to reduce their emissions, too. In this way, the effectiveness of one's individual actions can be multiplied and, thus, the positive effects, too. Of course, it is not possible to stop emitting GHG altogether. But the argument holds against sceptical objections that the complexity of the phenomena not necessarily means that individuals don't have a causal impact (see also Hourdequin, 2010, 2011)

Perhaps one would not want to state this conclusion unconditionally, because individual moral duty runs the risk of becoming overstraining. In order to settle the question to what extent this duty holds, at least two questions need to be examined (Bleisch, 2010): On the one hand, the value and the significance of emitting GHG has for the individual must be taken into account. It is certainly a matter of discretion what costs and efforts can reasonably be expected from an individual and a clear-cut answer is therefore difficult to provide as people normally have different sets of alternatives at hand depending on where they live, their financial situation, etc. Consequently, individual duties differ, also regarding the necessity to enact against climate change. On the other hand, one needs to evaluate the reasons why one wants to limit individual emissions and clarify why such a duty is put forward in the first place. Global warming doubtlessly figures among the large-scale problems and we all know that there is no time to lose. Promising solutions are still desperately awaiting and therefore, it seems plausible to expect people to undertake rather big efforts. The more is at stake, the more we expect people to do. All possible reductions should therefore be considered as a possible candidate, food choices being among them.

This certainly doesn't' prove that going vegan is imperative and perhaps somebody will choose other strategies for reducing her carbon footprint. Hence, even if individual duties have been successfully argued for, one still has to show why food choices must be given special attention. The answer to this will depend on the effectiveness and availability of this and other strategies and which of them we can reasonably expect people to assume it. In addition, one may want to ask, who in particular has the duty to reconsider her personal diet.

Going vegan – imperative for who?

Before tackling these questions, I would like to underline that if the case for individual duties has been successfully argued for and if we can assume that people should live a climate friendly life from an ethical point of view, this weighs rather heavily against the private matter stance. Henceforth, the defenders of the claim must prove that food choices can be ignored or that it is at least unreasonable to expect people to eat climate friendly or show this strategy to be ineffective, etc. Given the focus on western diets and the high intake of animal products on a regular base, opponents face a hard time in my view. People who consume animal products on a regular base inhabit industrialized countries or are comparatively well off and they don't have to struggle to have food on their table. In addition, alternatives at reasonable prices (put aside the fact that subsidising animal products allows even poor people to eat large amounts of animal products) are in many cases available to them even though not to all in the same degree. This will certainly make a difference to what extent somebody has to respond to the duty. All in all, one can conclude from this that the individual costs for eating more climate friendly are for many rather low while the positive effects are rather considerable. This conclusion can be corroborated by the fact that the necessary changes are rather modest if one decides to simply substitute the animal based products

by its plant-based alternatives. Hence, the next shopping-tour could turn out to be the beginning of reducing 1t of CO_2-quivalents per year.

Of course, changing habits takes time, but contrary to what is generally assumed, individual eating habits evolve constantly within a lifespan, depending on different factors (family, holidays, friends, work etc; see e.g. Brunner *et al*., 2005). Hence, they are less conservative and stable than one would first believe. This makes it still more attractive to encourage people to rethink their diet over along climate friendly standards.

All these advantages make climate friendly eating possible, but not an especially interesting strategy to lower the GHG emission. However, from a climate policy point of view, food choices should be considered more attentively. As mentioned above (see 2), livestock produces large amounts of methane and nitrous oxide, two very potent gases. They have recently become the centre of attention in climate policy as they remain relatively shortly in the atmosphere. Consequently, reducing these two GHGs and holding the other emissions at least constant would have positive effects in little time. This empirical fact underlines the importance of food choices. Opting for a more plant-based diet would allow contributing effectively to a very promising climate policy. Given the complexity of the problem of climate change, it is certainly wrong to claim that individuals alone have to carry the whole weight to combat the problem (see also Grunewald, 2010) as collective actions are undeniably needed. Institutions play an important role in influencing and promoting a lifestyle (see e.g. the subsidy policy), yet the role they can play depends heavily upon the individuals that built them up.

Conclusion

Animal products have a considerable impact on the climate, yet many believe food choices to be a private matter. If unnecessary emissions can be shown to be morally wrong, food choices, too, must be reconsidered and evaluated with regard to their GHG emissions. If they can be prevented, they should be. For many a vegan diet is a more readily available strategy than one first may assume, and because it is a very effective one, it should be given more weight in the individual (and institutional) climate policy.

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Food ethics: new religion or common sense?

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Abstract

The Austrian Animal Welfare Legislation obliges all communities to support the understanding of animal welfare in the public especially in youth and children. Teachers are stressed with compensating lack of education within the families. Additional challenging items e.g. ethics are not spontaneously welcome. Religion gets less important and there is urgent need for all-day school and comprehensive school between 10 and 14 years of age. Education in ethics including animal welfare could enrich or even replace classes in religion. Farm visits and experience in nature could enrich the additional time in school with practical exercise. The County of Vorarlberg therefore decided to create a competence-centre for human animal interaction. The concept is a classical train the trainer concept with education courses and farm visits for the teachers empowering them to teach the basics of animal welfare and ethics. The information material available is objective selected, scientifically approved and well applicable, including videos from CIWF. After the training course teachers are getting four different booklets for every pupil of the class for free: pet animals, farm animals, wild animals and experimental animals. Finishing the class all pupils get a certificate as 'animal experts'. Editor is 'Tierschutz macht Schule' a society founded to transfer knowledge about animal husbandry and animal welfare form science to the public. Some teachers prefer inviting a specialised animal welfare teacher to give the classes or for assistance. Highlight is the final farm visit with direct contact to living animals. This regional concept is referring to data from Eurobarometer proving that the purchasing and nutrition behaviour of consumers significantly correlates with their knowledge and background of experience with local animal husbandry and farming systems. Additional precondition is transparent information and clear labelling along the chain of production. Pupils with learning or behavioural problems are showing maximum progress in their social skills within long term programme (farm visits every week). Not to underestimate the education effect of the programme for the parents, who are also interested in the booklets and the reports of their children about their contact to animals. In sustainable development and ethics this regional educational concept proves once more that it is possible to get the message across gaining children as ambassadors educating their own parents: not with creating a new religion, but only by giving good example of fair action respecting animals as sentient creatures and experience on the level of common sense.

Keywords: animal welfare, education, farm visits, labelling

Introduction

The attitude of EU citizens towards animal welfare is currently documented (Special Eurobarometer 270, 2009). It is shown that there is a considerable interest in more knowledge about animal husbandry and a demand for more and clearer information, especially about the welfare conditions behind the products on the supermarket shelves. Higher standards are considered to guarantee healthier products and higher quality. For animal friendly products up to 25% higher prices are accepted as well as financial compensation for improving welfare standards. But how to get all that information about animal husbandry, ethics and fair products to the consumers, enabling them to take a responsible decision when purchasing.

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The education problem

The education system in Austria is well sponsored by public money but less effective. Our PISA-ranking is a disgrace since years. The ability to grasp meaning from reading is a fundamental requirement of basic educational skills. Even more complicated if it is a religious or philosophical argumentation or dealing with ethics. On the other hand there is an increasing longing for personal values and attitudes within parts of society. Religion and ecclesiastical institutions increasingly are not able any more to answer the last questions of modern life dominated by greed and excessive consumption. This way of life at least in western and industrialised countries leads to rising numbers of overweight children with consecutive health problems and financial collapse of health care system. The correlation between obesity and meat consumption is well known (Spencer *et al*., 2003). But how to change attitudes and habits in nutrition when global acting enterprises earn their money by selling billion tons of sugar and meat followed by drugs to cure diseases caused by supernutrition. The perspective that food consumption of the rapid growing population of the world has to change to organic production or will end up in disaster (Löwenstein, 2011) is not yet common in public mind. But the awareness of health and beauty problems caused by overweight and of striking climate change is getting closer to reality in everyday life. Finally, one has to be willing to challenge the own conscience by the simple fact that animals have to be killed if you want to eat any meat. In addition to consider your amount of meat consumption causing health problems (at least 50% of diseases of civilisation) you could end up in the following moral dilemma.

The moral dilemma

Austrian Animal Protection Act has two very important principles concerning the prohibition of killing animals (§ 6):

1. It is prohibited to kill animals without proper reason.
2. It is prohibited to kill dogs or cats for the purpose of manufacturing food or other products.

The 'moral split' in modern western society could not better be shown. It is not mentioned explicitly but probably generally assumed as common sense, that killing animals for meat production has to be accepted as proper reason. But you will get into a state of increasing argumentative emergency in correlation with your meat consumption. Is it a proper reason to kill so many animals to produce so much meat that you are able to waste 30% to 50% of this production and get life-threatening illness with a probability higher than 50% by the intake of the rest? Especially if you bear in mind the principle difference between species. Within mammals you could argue an evolutionary hierarchy between humans and animals. But how could you reason for different treatment of a dog and a pig respecting the latter demonstrably to be more intelligent? (Singer, 1979) If you go vegetarian or vegan, how can you accept killing so many farm animals to feed your pet with the high priced waste of the meat production? As our purchasing and food consumption-behaviour has a direct correlation to the conditions of the animal husbandry systems of farm animals, animal welfare of these is a collective responsibility of the whole society, not only of consumers (Kunzmann, 2007). Not only solid information but also concernment and experience are essential to change attitudes and habits within society (Special Eurobarometer207, 2009). This is probably one of the reasons the 'transfer of knowledge' to become two main topics in the communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee on the European Union strategy for the protection and welfare of animals 2012-2015 (COM 2012). The moral dilemma only can be solved considering also ethical principles within giving appropriate information to consumers and sufficient knowledge to different stakeholders.

Transfer of knowledge

We all together grew into a permanent learning society. The transfer of knowledge has to consider various target groups. This happens well organised and traditionally in formal education in schools with teachers. The acquirement of basics skills like reading and writing is mandatory and one of the most important human rights. The possibility of more ore less free access to higher education at university level is common in many European countries and seen as precondition for economic prosperity of regions. But also the occupational career of manual workers depends strongly on their vocational training. Also farmers have to be well trained because of specialisation in animal production. According to keep our leading position in economics and quality of life permanent learning is a duty of the whole society and every single person representing an important part of the whole. All members of society need access to basic knowledge. From an ethical point of view free trade and economy depends on well informed and responsible producers and consumers to be also a fair trade community. The quality of products is defined by completing all expectations of consumers. Even the technical ISO 8402-1986 standard defines quality as 'the totality of features and characteristics of a product or service that bears its ability to satisfy stated or implied needs'. In food production the process of production is getting decisive importance for marketing, because the 'needs' are not only technical specifications like ingredients and microbiological safety. Aspects of environment and animal protection as well as fair trade are getting more important in an increasingly saturated market and for sustainable orientated or even spoilt consumers. Market analysis like 'RollAMA' in Austria report once more above average growth rate of the organic sector in fresh food by 21.5% in 2010. The moral quality of products is challenged, not only in consumer goods but also in services. Every profession is well advised to define an own ethical code. Stafleu and Meijboom (2009) found 'moral acting professionals' to be the precondition for gaining professional autonomy and acceptance in society, especially for smaller groups like farmers or veterinarians.

Transfer of knowledge is not only a question of target group but also of subject and message.

There are no facts without attitudes behind: 'Scientific evidence is no facts but an argument' Peter Kunzmann argues in his keynote lecture surprising the predominant scientific participants of the last annual conference of the European College of Veterinary Public Health. Following different ethical theories behind and respecting choice influenced by experience and different individual approach may result in more or less differentiation between animal welfare and animal rights activists. Rippe (2011) found 24 different types of animal welfare people. Concerning food ethics among most scientists there still is a traditional biological or technical approach of animal husbandry, predominated by a pathozentric understanding of animal welfare. In a holistic point of view you must not forget the interdependences between ethics, society and economics e.g. feeding the world and climate change. Within this content the key question seems to be the moral acting person respecting his responsibility for all his fellow creatures.

For various but clear specifications the transfer of knowledge should be science based but easily understandable which often seems to be a contradiction. Consumers only can act 'moral' responsible if declaration including labelling of products and processing is clear and standardised. This should be attempted at least at EU-level, preferably at WTO-level regarding free global and fair trade. From a strategic point of view a principle decision has to be taken between mandatory or voluntary implementation and between a clear-cut single level and a dynamic multi-level system (Schmid, 2009). Welfare Quality® (http://www.welfarequality.net) a very ambitious scientific EU-food quality concept for animal related products assessing animal welfare was finished 2010 but failed to be accepted by the market until now.

To reach stakeholders and consumers the content of education programme has to contain a specialist curriculum as well as general and social skills. The biggest challenge is to enhance awareness of problems

and self-responsibility especially in expectation to change attitudes and habits of all members of society, because animal welfare and food ethics are common responsibility of all actors in the food chain. The best chance for success in changing habits is to start with children, the earlier the better because they are the consumers of the future.

A small group of veterinarians, most of them specialists in animal husbandry and animal welfare, therefore developed an educational concept of transfer of knowledge in animal welfare and food ethics from kindergarten to university ending up in founding a society named 'Tierschutz macht Schule' (http://www.tierschutzmachtschule.at).

Animal welfare goes to school

Austrian Animal Protection Act has one more probably unique obligation concerning promotion of animal welfare:

Federal government, provinces and communities are bound to awake and deepen the understanding of the public and especially of the youth for animal welfare...

This means a legal binding mandate for education of the public in animal welfare. Implementing this expects the association aims to improve the living conditions of pets, farm animals, laboratory animals and wild animals in our society. 'Tierschutz macht Schule' is a platform for persons, institutions and organisations that represent a balanced and respectful communication of animal welfare relying on scientific findings. The process of transfer of animal welfare knowledge to the public is started as early as possible in school. The pedagogues also trust in retrograde education of the parents by their children. Best example is the separation of waste which also started in primary schools. According to the largest consumer survey (Reader`s Digest European Trusted Brands 2010) Austria reached leading position within Europe. Why should this not also function in animal welfare and food ethics? The basic scientific pedagogic concept was to show the change from wild animals to farm and pet animals which took a period of many thousands of years, originating from one single wild form and creating a wide range of various different breeds. Some extreme forms show tendency for suffering and disease (Blue Belgian in cattle, brachycephaly in dogs and cats). Always to remind that the basic needs and the behavioural repertoire of these animals did not change within the process of domestication. Key message is that the fitness for use of an animal to be kept as farm or pet animal and the requirement to the owner is defined by the specific character and intrinsic value of an animal (Kunzmann, 2011). This has to be respected and evaluated in every single case and action of using animals. The ethical principles are simplified in terms as 'fairness'. The target group of children are pupils aged between 8 and 14 years. The teachers get training courses about the content of the booklets and practical instruction at farm visits. The Goethe-University in Frankfurt found that the motivation of teachers to be very poor because they suffer from bad image and little acknowledgement in society. The administration system is as overloaded as the curriculum. Lack of education within the families results in additional problems in school including violence and loss of respect and confidence. A never ending process of reforming structures also has negative impact on the advanced training of the teachers. New challenges with difficult subjects like animal welfare and ethics therefore find little willingness to deal with. The hope that many teachers spontaneously would participate at the courses was disappointed. On the other hand many teachers like to be supported by experts form outside. Therefore additional support by specialised animal welfare teachers who give or assist classes in this subject was organised. This development reminds of the successful example of caries-prophylaxis in schools by training professional brushing of teeth with assistance of nurses. The mascot of this program was named 'Max Prophylax'.

Animal experts

Funny mascots are the leading figures introducing the pupils into the world of their fellow creatures. Each species is presented and described with is characteristics starting with its originating form in wilderness explaining their species specific needs. Following the description of the husbandry systems of these animals in modern civilisation accompanied with all the main problems resulting in utilisation as pets, farm or experimental animals. There are a lot of pictures, drawings and also cartoons to illustrate the facts. Questionnaires and crossword puzzles invite to active participation therefore each teacher also gets his own booklet including the right answers. In the farm animal booklet there is a 'shopping checker' helping to detect animal friendly products in the super market. There are also interviews with children, consumers and stakeholders. Every pupil gets his or her personal booklets for free and finally a certificate as 'animal expert'. The booklets and the classes are the theoretical background for the second step with should not be missed because of sustainable effects. Periodical Eurobarometer, many field studies and monitoring give clear evidence that experience with living animals and adventure on farm are the most effective tools to change attitudes and finally habits. The knowledge of facts is one thing, but the decisive point is the background of experience. Direct and repeated contact to animals (touching, grooming, smelling, caring) gives understanding and creates long term effects on the basis of empathic feelings and hormonal binding (Olbrich and Otterstedt, 2003). Even in rural areas the knowledge of average citizens about animal husbandry systems and farming is very poor almost missing completely. On the other hand the desire for getting into contact with living animals is enormous. A farm visit is also a highly welcome alternative to classes in school. Reforms in Austria point into direction of all-day school. This offers opportunities for outdoor activities as supplementary elements in education.

Farm visits

A visit on a farm offers a lot of possibilities for better understanding of farming and a deeper feeling of responsibility for the handling of animals kept for food production. The key message of the video 'farm animals & us' from Compassion in World Farming is: 'It is your choice, it is your responsibility' is the same, as written down and shown in the booklets. The most efficient but also effective way to remember everybody everyday of his own and direct responsibility for the conditions of the usage of farm animals is to show reality and to get direct experience. Good theoretical preparation by studying the booklet makes the farm visit even more effective. But no picture or drawing of a full slatted concrete floor is able to make feel the 'comfort' of living all life long without bedding but limited space to move and rest. Not to forget the odour of your own excrement stored under your living area. Nearly all people are deeply concerned, nearly shocked by the fact that 90% of pork and beef production in Europe is from slatted floors (Foer, 2009). Many cannot believe this to be legal and so common. Members of farmers associations tend to present an idyllic world. It must not be the intention of an educational programme to only blame the current system, but to show reality. Therefore it is important to also light up alternatives like free range. In order to demonstrate the difference not only concerning quality of animal friendly husbandry systems but also the necessary higher price of the product. The effects of farm visits with better understanding for local farming are a big chance for regional high quality labelled products. In our rural and mountainous region agriculture has no chance in competition with mass production. To promote and support less intensive farming systems is another aim of this education programme. The higher price for better products can show important side effects. The reduction of meat consumption is no threat for producers and retailers any more because profit margin is rising. It is a benefit for each consumer because of less health and overweight problems and better conscience. The socio-economic balance sheet shows clear gain for the whole community because of less health costs and better environment. In the end animal education programs make a remarkable contribution to progress in culture of society.

Active and long term programme

One of the principles of the programme is active participation. Especially for pupils it is very important to take action to get engaged. Initiatives for the protection of animals activate spontaneously: making interviews with consumers, organising discussions with stakeholders, writing letters to editors or politicians, or even write songs or a musical. One of the most impressing and affecting results are the effects of long term visits on farms on pupils with physical or mental deficits or emotional and behavioural disorders. They just did normal work on the farm, feeding and taking care of animals. They had a clear structure in daily life, responsibility for the animal and got spontaneous and positive feedback from them. The caring personal was totally impressed by the improvement their clients made almost automatically and of its own volition.

Conclusions

- Knowledge about animal husbandry is precondition for responsible consumer decisions.
- Information and labelling has to include ethical principles and considerations.
- The different attendance of farm and pet animals is unfair and a moral dilemma.
- Austria has a probably unique legal obligation concerning promotion of animal welfare.
- The transfer of knowledge should start in school as early as possible using scientific based information and followed by experience within farm visits.
- Active and long term programme are even more effective changing attitudes and habits.
- Animal welfare education and food ethics contribute to progress in culture of society.

Therefore it is neither old ideology nor new religion, but common sense.

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Section 14. Science and governance

Climate change and biodiversity: a need for 'reflexive interdisciplinarity'

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Abstract

Climate change is today perceived as one of the greatest threats to biodiversity and ecosystem services. This is an important concern for current society, as the deterioration of biodiversity will have dire implications for agriculture and the provision of food. At the same time, we see many conventional agricultural practices (i.e. deforestation and monoculture) serve to exert their own stresses on biodiversity, while also compounding the issue of climate change. In this context, an increasing number of scientific research projects are being funded to further understand the complex interrelations between climate and biodiversity, and support society's collective decision-making on this issue. Faced with the complexity and uncertainty inherent to climate change, this paper begins from an assertion that interdisciplinary science, bringing together scientists working within the fields of biodiversity, climate and agriculture, is key to generate socially-relevant knowledge, and presents thus one component of society's response to this issue. On this basis, the paper introduces the idea of 'reflexive interdisciplinarity' as one way for better nesting science in society. Nesting science in society is a long-term, dialogic, reflexive and evolving process. Hence, the results presented here only represent the first steps of this process, that was initiated in 2010 through participatory action research within the interdisciplinary 'HUMBOLDT' project; funded by the French 'Scientific Consortium for Climate, Environment and Society', and exploring the relationship between climate change and biodiversity in the Alps. In the HUMBOLDT project, reflexive interdisciplinarity was given expression through 'reflexive tools'. In presenting its findings, the paper argues that attitudes of reflexivity were important in helping scientists to conceptualise their place in a wider scientific community, and in turn, how this community is nested in society. By recognising the normative and political nature of their research, reflexive interdisciplinarity improved scientists' ability to engage in the negotiations that constitute the science-policy interface for climate change.

Keywords: interdisciplinarity, reflexivity, science-policy interface

Introduction: climate change, biodiversity and food production

Climate change is increasingly perceived by state, scientific and non-governmental organisations as one of the greatest threats to biodiversity and ecosystem services. A growing scientific literature (see, e.g. Leadley, 2009; Pereira *et al*., 2010) asserts that changes in climate, i.e. temperature rises, changes in precipitation patterns, ocean acidification, and shifts in ocean currents, are projected to result in large losses or shifts in the distribution of species and their habitats. This is an important concern engaging society as a whole, as the deterioration of biodiversity, and associated ecosystem services, will inevitably have dire implications for agriculture and the provision of food that it supports.

At the same time, complicating the issue, conventional agricultural practices such as deforestation, monoculture and mechanised production systems, exert a stress on biodiversity in at least two ways. First, important amounts of greenhouse gases are released in the atmosphere (FAO, 2010); in 2005, agriculture accounted for an estimated emission of 10-12% of total global anthropogenic emissions of greenhouse gases (Smith *et al*., 2007). Second, degrading or destructing habitats to convert them into arable crops contributes to declines and extinctions of plant and animal species; modifications and

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losses of biodiversity that are shown to negatively impact the regulation of regional and global climate (Leadley, 2009).

Hence, climate change, biodiversity and food production are interconnected through uncertain feedbacks, retroactions and emergent properties. This complexity and uncertainty pose to society the question of what is the best way science can be used to understand these interactions, and to support decision-making processes.

Interdisciplinary science as one component of society's response

Climate change has been described as a 'creative force' to interrogate and rethink the various facets, or 'projects' of society, such as science, economics, health, or agriculture (Hulme, 2009). In this way, the project of 'science' constitutes one component of society's response to access knowledge on the climate change and biodiversity issue. As noted, this issue is complex, and faces numerous uncertainties. It thus demands a science that is integrated, or interdisciplinary, in order to better understand and work within the complexity and uncertainties surrounding it. In brief, interdisciplinary science can be defined as "long-term cooperation process whereby scientists, in order to mobilise knowledge around a complex and multi-facetted topic, conjugate complementary disciplinary approaches [...] through the sharing of tools, methods, and approaches" (Blanchard, 2011).

The contributions of interdisciplinary science to the climate change and biodiversity issue are threefold. First, by crossing the several perspectives on climate, biodiversity and agriculture, interdisciplinary science is more appropriate for dealing with its complex and uncertain nature; when 'normal', disciplinary science may not grasp the global picture. Second, by being problem-focussed (Romm, 1998), interdisciplinary science aims at producing socially relevant knowledge, that is able to support decision-making around the issue. Third, and probably the most important contribution of interdisciplinary science, when it is coupled with a step of reflexivity (defined in the following section), is that it initiates a process of nesting science in society. Knowledge is not considered to be insularly created within the scientific community only, but is socially negotiated, and produced under the values, power systems, and ethical claims of society.

In this paper, we introduce the notion of 'reflexive interdisciplinarity' as a way of nesting science in its social context, and present the initial steps of this process through the experience of the interdisciplinary HUMBOLDT project.

Reflexive interdisciplinarity for nesting science in society

With the growing awareness of complex global issues and 'epistemological uncertainties' since the 1990s, scientific rationalism on one hand, adopting a modern view of the world seeing humans and nature as separated (O'Brien *et al*., 2010), and the dominion of science over other knowledge systems, such as local and traditional knowledge, started to be questioned in recognition that multiple valid perspectives exist, and indeed are required for the study of complexity. This changing and uncertain world provided the context for many authors to advocate for a different kind of science, more reflexive, integrated, adaptive and critical.

Gibbons and colleagues (1994) defined this new 'reflexive science' as an adaptive and critical endeavour, where there is no established truth nor final objective. Indeed, for complex, global and long-term issues such as climate change, biodiversity and food production, the actors involved, objectives to achieve and set of responses designed are likely to change as the issue and its broad context evolve; demanding thus an adaptive, flexible and critical epistemology. In parallel, Funtowicz and Ravetz (1993), emphasised

the integrated nature of this reflexive science, in the sense that scientists should open their research to the scrutiny of the broad scientific community and relevant socio-political actors, in order to remember that their output is only one representation among many other possible.

With the discussion on reflexive science in mind, we can define reflexive interdisciplinarity as an endeavour starting within the scientific community, but aiming, in the long-term, at extending its boundaries to non-scientific actors and knowledge. It starts indeed with interdisciplinary interactions whereby scientists learn about their disciplines and themselves as they confront and compare them with other disciplinary perspectives and experiences (Blanchard, 2011). Reflexive interdisciplinarity is thus based on a self-examination, whereby the scientist tries to recognise and make explicit his/her experiences, presuppositions, motivations, preferences and interests, and their impacts on scientific research (Bourdieu, 2001). However, this reflexivity quickly encourages scientists to reflect beyond their scientific frames; for instance on questions such as how best to nest science in society when faced with complex issues. Indeed, as scientists are in a powerful position to decide what constitutes knowledge and what does not, reflexive interdisciplinarity allows them to acknowledge the plurality of legitimate perspectives around complex and uncertain issues, and aims at empowering the non-scientific actors concerned by these issues by including them into the process of knowledge framing and construction, and by voicing their perspectives, priorities and needs. Concerned with complex, global and long-term issues, reflexive interdisciplinarity goes beyond looking at well-defined problems, but constitutes a long-term, continuous and adaptive attempt to work within complexity by better nesting science in society. Reflexive interdisciplinarity aims at implementing incremental changes, supported by adaptive research, allowing visualisation of an evolving decision-making process, and the way in which subsequent iterations learn from prior decisions and actions.

Contributions of reflexive interdisciplinarity to the climate change and biodiversity issue: example of the HUMBOLDT project

The HUMBOLDT (Human Impacts on Biodiversity, Ocean Environment and Climate in the Anthropocene) research project is funded by the French 'Scientific Consortium for Climate, Environment and Society' for the period 2009-2012. This Consortium is charged with articulating, funding and supporting, at the national level, interdisciplinary research projects concerned with the impacts of climate change on social, economic and environmental spheres.

Within this context, the objectives of HUMBOLDT first consist in the interdisciplinary understanding and modelling of the links between climate change and the evolution of biodiversity in the French Alpine region, by bringing together two broad scientific 'communities': climate scientists and biologists. Secondly, in an attempt to mobilise this interdisciplinary knowledge for decision-making, HUMBOLDT tries to elaborate 'biodiversity indicators' of the impacts of climate variability on biodiversity, to be used in environmental and agricultural management.

The results presented in this paper originate from a six-month participatory action research study led in 2010 by two scholars in Science and Technology Studies (including the author). Participatory action research (Lewin, 1947) is an inquiry which invites action researchers and the actors of their study (here, the HUMBOLDT scientists) to closely cooperate along iterative cycles of action and reflection, where theory and practice mutually nurture each other. In our case study, the action research was articulated around five main iterative steps of semi-directed interviews and focus groups. Through this action research, we explored the dynamics of interdisciplinarity for climate change with ten volunteer scientists from the HUMBOLDT project. These mid- to late-career natural scientists were composed of eight men and two women, with various disciplinary backgrounds ranging from climate sciences (statistical

climatology, meteorology and climate modelling) to biology (genetic ecology, vegetal ecophysiology and biodiversity modelling).

The participatory action research process aimed at putting into practice the idea of reflexive interdisciplinarity as a way to better nest science in society, particularly through reflexive tools, such as 'writing pauses', giving scientists the opportunity during the action research to individually write down their observations, questions and ideas in a personal logbook; 'summary tables', to compare the various disciplines involved in HUMBOLDT in terms of their data, scales, tools, contributions to the project and expectations towards it; and an 'inaugural contract', to allow the scientists of HUMBOLDT to clarify and collectively agree upon the scope, objectives and means of the project, and role of each discipline and scientist, in a signed contract – this contract was meant to structure the early interactions of the scientists, while ensuring some flexibility, as it could be changed at any moment (for an exhaustive presentation and discussion of the reflexive tools, see Blanchard, 2011).

These reflexive tools helped to implement reflexive interdisciplinarity, as they nurtured reflexive discussions on the ways to construct knowledge around the issue of climate change and biodiversity, and the ways to link interdisciplinary science to decision-making processes. We see in the findings presented hereunder that the HUMBOLDT scientists remained in a 'deficit model' of the science-policy interface. However, reflexive interdisciplinarity had the capacity of initiating such debates, which are the first steps of the long-term process of nesting science in society. Along the action research, both HUMBOLDT scientists and ourselves were encouraged to scrutinise our views and assumptions on the role of our science at the science-policy interface. As first steps of this long 'nesting' process, two contributions of reflexive interdisciplinarity are to be noted, in terms of an engagement of the HUMBOLDT scientists in discussions of (1) complexity, uncertainty, and plurality; and (2) the role of interdisciplinary science at the science-policy interface.

Engaging in discussions of complexity, uncertainty and plurality

The step of reflexive interdisciplinarity, supported by the above-sited tools, saw the ten HUMBOLDT scientists engaging in discussions of the climate change and biodiversity issue in terms of complexity, uncertainty and plurality. This is despite the professional role of natural scientists (i.e. modelling reality, predicting the future, and reducing uncertainties), as well as the way science as an institution works, according to standards of truth and objectivity, constituting a great influence to orientate them towards a 'normal science' approach of the science-policy interface; privileging sound scientific knowledge rather than dialogue across other knowledge systems.

Most significantly, the frequently used mechanistic practice of breaking down the issue of climate change and biodiversity into its constituent parts and simplifying its processes, was challenged by most HUMBOLDT scientists with reference to complexity and uncertainty. Indeed, the scientists wondered whether "mechanist modelling [allows] to work with emerging uncertainties", and acknowledged the "interconnected implications [of the issue] that concern all scales, all countries, and all the aspects of society [which] necessitate an integrated and holistic approach". Furthermore, this complexity surrounding the issue made some HUMBOLDT scientists acknowledge the importance of integrating the decision-makers' perspectives in the framing process of their indicators, to render them "local, synthetic, and relevant". Even though the discussion of plurality remained at a level of 'forcing' non-scientific views into a scientific framework, the HUMBOLDT scientists formalised their first reflections on interdisciplinary science as socially relevant knowledge to support decision-making.

Engaging in reflections on the role of interdisciplinary science at the science-policy interface

The HUMBOLDT scientists engaged in discussions on the science-policy interface, and particularly on how best to link their interdisciplinary science to decision-making. Across the interviews and focus groups, the scientists made three propositions for connecting science with decisions and action. First, the HUMBOLDT project itself aims at creating linked climatic and biodiversity models in order to "provide decision-makers with data to better govern climatic risks and draw pertinent adaptation policies. [...] We will [...] provide assistance with the understanding and use of the projections". Second, to address what the scientists perceived as a lack of scientific literacy among socio-political stakeholders, they advocated for reinforced communication via mechanisms like "shared conferences", "dissemination campaigns" and "school education". Third, the HUMBOLDT scientists recommended the use of a mediator, through scientific journalists for instance, who can act as a translator between the scientific and policy communities. These propositions on how science ought to be better engaged as the basis for rational decisions, reflects, rather than a dialogue, a linear and one-directional transfer of knowledge into action, where science remains the legitimate provider of knowledge for fuelling decision-making processes, and where other stakeholders need to be 'educated'.

However, having noted this tendency of HUMBOLDT scientists to depict the science-policy interface in terms of a deficit model, there was also widespread acknowledgement of the social processes operating at the interface. For instance, the science around the climate change and biodiversity issue is perceived as permeable to socio-political influences. The scientists discussed their social motivations, i.e. the importance for them of being "useful" and creating "applicable knowledge to support decision-making", as well as the socio-political pressures bearing on their science: "decision-makers need scientific data to better govern climatic risks and draw pertinent adaptation policies". The science-policy interface for climate change was therefore not only perceived as a 'tidy' linear process where science feeds policy, with relationships of influence and power emphasised by the scientists.

Conclusion

The reflexive interdisciplinarity established with the HUMBOLDT scientists has encouraged them to formalise initial reflections on the role of interdisciplinary science at the science-policy interface. It has helped them to deal with the far-reaching conflict between, on one hand, the recognition of the contributions of more participatory approaches to complex problems, and on the other hand, the preservation of the independence and integrity of science. These first reflections constitute hence the first steps of a longer process; that of better nesting science in society when faced with complex issues.

Reflexive interdisciplinarity constitutes a first step to collectively formalising scientists' own values, priorities and practices along which to apprehend climate change and its various impacts on biodiversity and food production; and hence to reflect upon the model of science and policy that we, as a society, aspire to.

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Changing societies: ethical questions raised by ANR-funded research programs and projects related to climate and environmental change

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Abstract

The increasing human use of natural resources induces global environmental change that impacts climate, biogeochemical cycles, biodiversity, animals and plants as well as human society. Most research on climate change focuses on uncertainties in climate projections and calculation of mitigation costs. The Agence Nationale de la Recherche (ANR), a French public organization devoted to competitive project funding in both fundamental and applied research, launched two successive three-year calls for proposals on 'Vulnerability, Climate and Society' in 2006 and 'Global Environmental Changes and Society' in 2009, thus enlarging the topics and recognizing their impacts by developing the concepts of resilience and adaptation. A total number of 75 projects have been financed. More than half of them have a geographical focus on climate change and natural resources in different parts of the world (i.e. France, Africa, Asia, the Mediterranean region, and Arctic and Antarctic zones). Most projects are interdisciplinary. Important ethical issues appear in the topics and methods chosen. Some research projects focus on the causes and effects of climate change in the past and in the present. Others are more concerned about what we can do about climate change in the future and its consequences on rural, urban and peri-urban societies. Frequent issues relate to trust, democracy, vulnerability, participation and community development, as well as knowledge gaps and divides. Ethical issues related to global environmental changes are evolving and focusing increasingly on human beings and their behavior.

Keywords: ethics, research programs, vulnerability, governance

Introduction

In 2007, two months before the opening of international negotiations on the future of the Kyoto Protocol, the Nobel Peace Prize was awarded jointly to the Intergovernmental Panel on Climate Change (IPCC) and to Al Gore, 'for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change'. This joint Prize symbolizes the extreme complexity of global environmental change, a phenomenon unfolding in time, whose extremely intricate and highly non-linear dynamic systems are difficult to understand and to anticipate for both, the general public and the scientific community.

Research institutions and researchers are more and more concerned about their responsibilities and the importance of an ethical reflexivity in research programs and projects. Why? The belief that freedom of research is universal was based on the premise that science necessarily led to progress. Hiroshima destroyed this belief. Today researchers understand that their freedom has a price, and reasons such as the growing complexity of science and the discovery of new fields, the shorter paths between fundamental and applied research and the stronger linkages between research and innovation. Ethics committees are being created at national and institutional levels, and researchers, who are starting to think about the consequences of their actions, refer to the Jonas principle of responsibility (Jonas, 1984), and what they should do to aim 'at the good life with and for others, in just institutions' (Ricoeur, 1992). Pierre Léna

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and Michel Serres proposed the writing of a 'scientist oath' following the Hippocrat oath which would be signed by all scientists to make them discharge their responsibilities (Serres and Farouky, 1997).

However, this ethical reflexivity at the institutional level, team and individual levels takes time. In order to understand ethical reflexivity, we looked at the research programs on global environmental change funded by the French national research agency (Agence nationale de la recherche – ANR) between 2006 and 2011 and the research projects selected to see how ANR programs and calls for proposals encourage researchers to sense and disseminate the ethical implications of global change, and how the research teams react.

Presentation of ANR and its programs on climate and environmental change

The French national research agency – ANR

ANR was created in 2005 to increase the number of research projects generated by the scientific community worldwide, and to provide funding based on calls for proposals and peer-review selection processes. The ANR deals with both public research institutions and industries with a double mission of producing new knowledge and promoting interaction between public and industrial laboratories. It is a mix of a science-based funding agency and a strategic funding agency (Braun, 1998). ANR's funding cycle has three steps: (1) programming; (2) selection; and (3) monitoring and *ex post* evaluation. Ethical aspects are part of all three: the definition of the contents of programs and calls for proposals, the selection of projects, and the follow-up of projects, especially the dissemination of projects results.

The ANR programs on climate and environmental change

As underlined by the report by the World Commission on the Ethics of Scientific Knowledge and Technology

> ...we currently have analytical and predictive knowledge that enables us to foresee, prevent, mitigate and adapt to aspects of climate change, far beyond what was possible in earlier times. On the other hand, we are still confronted with a number of uncertainties in our scientific knowledge base that combine to put constraints on our ability to predict when and where, and with what intensity, the various effects of climate change will emerge (UNESCO, 2010).

Since its creation, ANR has issued two programs, each with three yearly calls for proposals related to climate and environmental change in order to improve the scientific knowledge on this topic:

- VMC(S) – Vulnerability: environments, climate (and societies) – 2006, 2007 and 2008;
- GEC(&S) – Global environmental changes (and societies) – 2009, 2010 and 2011.

A total amount of 31M€ has been given out to research projects. Other institutions in France -for example the Climate-Environment-Society consortium, the program supported by the Ministry of Ecology, Sustainable Development Transports and Housing called 'Management and Impacts of Climate Change', the ERA-NET Climate Impact Research & Response Coordination for a Larger Europe (CIRCLE 2) – fund research projects on climate change but are not analyzed here.

Ethical issues encouraged by the ANR programs on climate and environmental change

Due to training, the organization of research and evaluation criteria, researchers have a tendency to look at research questions from a rather restrictive point of view. Traditionally, climate change has attracted research from the earth sciences and the climatology. An ethical approach to climate and environmental

change require a change of approach with more transdisciplinarity, more inter-institutional collaboration and a more systemic outlook.

Vulnerability: encouraging transdiciplinary research on this complex subject

The term 'vulnerability' is used in many different ways by various scholarly communities (Füssel, 2007; McLaughlin & Dietz, 2008). Adger (2006) has reviewed traditions of vulnerability to environmental change and the challenges for present vulnerability research to incorporate resilience and adaptation. He notes that 'the challenges for vulnerability research are to develop robust and credible measures, to incorporate diverse methods that include perceptions of risk and vulnerability, and to incorporate governance research on the mechanisms that mediate vulnerability and promote adaptive action and resilience'. This challenge makes it difficult for the reviewers when they examine the projects.

The objectives of the first two calls of the program entitled 'Vulnerability: environments and climate' (VMC) were to deal with the vulnerability of the air, water and soil to environmental change caused either by climate change or human beings, and thereby to encourage integrated transdisciplinary research. There were no thematic axes. The following year (2008), ANR decided to pay more attention to vulnerability from a societal and economic perspective, to attract researchers from the social sciences and have them work with researchers from the earth sciences and the natural sciences. Links with GMES (Global Monitoring for Environment and Security), the European Program for the establishment of a European capacity for Earth Observation, was also encouraged. These changes were underlined in the title which became 'Vulnerability: environments, climate and societies' (VMCS). The aim here was to look at the vulnerability of physical, biochemical, biological and social vulnerability through a transdisciplinary approach. Close links were created with the 2004-2012 French Climate Plan, the 'Stratégie nationale d'adaptation au changement climatique' and the 'Stratégie nationale de développement durable 2010-2013'. VMC and VMCS managed to start bringing together physical, biological and human sciences, but very few projects on the perception and toughness of human system confronted to global change were selected. Overall, a total number of 44 projects (out of 139 received) were funded for a total amount of 26.1 M€. The projects involve 221 partners (14 private firms; 6.8% of the funds), and an average number of 5 partners by project. The academic community – more used to research on processes than to integrated systemic and pluridisciplinary approaches – was quite surprised by the ambition of the program. It responded very well to the first call for proposals and not so well afterwards, which explains the decrease in the number of the selected projects.

As shown in Table 1, over the six year period, 29% of the projects have looked at the question of vulnerability of resources and societies. 31% of the projects have dealt with climate and ecosystems, 31% have considered resource and risk management, and 9% social dynamics, governance, values and conflict. The theme which sparked off the most continuous interest is hydrology and anthropo-ecosystem vulnerability. This was because of the effects of serious water stress on human security and resources during various drought or flood events. Agro-ecosystem management, marine ecosystem changes and coastal zone vulnerability had a relatively high response rate. These zones face anthropogenic and environmental global challenges, as urban pressure and river loading increases largely in conjunction with overfishing, river water acidification and global warming. Some topics which attracted specialists during the first call for proposals but had a light pluridisciplinary approach were projects related to soil vulnerability, carbon ecosystem changes, climate changes and extremes, marine and continental ecosystem changes. On the other hand, management of risks and biological resources, as well as governance and value issues, drew growing attention over time thus reflecting the evolution of call contents and new scientific questions at the interface between development and environment. The projects recently selected are mostly on resource and risk management, i.e. the consequences of climate change on societies, and also on vulnerability. None are on climate change per se.

Table 1. Classification of the projects by themes.

Main classes	2006	2007	2008	2009	2010	2011	Total	%
Climate and ecosystems								
Climate changes and extremes	4	3	1	1	0	0	9	12
Marine ecosystem changes	1	2	2	0	0	0	5	7
Continental ecosystem changes	1	1	2	2	0	0	6	8
Carbon ecosystem changes	2	1	0	0	0	0	3	4
Subtotal	8	7	5	3	0	0	23	31
Vulnerability								
Soil vulnerability	1	0	3	0	0	0	4	5
Coastal zone vulnerability	3	1	0	0	0	1	5	7
Hydrology and anthropo ecosystem vulnerability	3	4	1	1	2	2	13	17
Subtotal	7	5	4	1	2	3	22	29
Resource and risk management								
Halieutic resources management	0	0	0	1	0	2	3	4
Agro-ecosystem management	2	0	1	1	3	0	7	9
Livestock management	0	1	1	0	1	0	3	4
Health risk and management	0	0	0	1	1	3	5	7
Regional risks and management	0	0	2	0	2	1	5	7
Subtotal	2	1	4	3	7	6	23	31
Social dynamics, governance, values and conflict								
Subtotal	0	0	1	0	3	3	7	9
Total	17	13	14	7	12	12	75	100

System: encouraging the emergence of an Earth System Science

The second program on global environmental changes (GEC) launched in 2009 was focused on the emergence of Earth System Science, a concept developed by the Earth System Science Partnership (ESSP). The first 2009 call gave emphasis to integrated studies on the evolution of socio-economic and ecologic systems under global environmental constrains. Twenty-four projects were submitted and seven funded, reflecting the limited readiness of the research community to tackle such broad issues that need to involve social sciences with both earth sciences and life sciences. To fine-tune and publicize this program, a one-year foresight workshop on GEC was held in parallel in 2009. ANR saw that it was difficult to encourage researchers to work on new topics and used this workshop as a tool to bring together a community whose members were not well acquainted with each other. Consequently in the 2010 and 2011 calls, the role of social sciences and humanities was clearly identified as a key contributor to human-environment adaptation issues. It was reflected in the new title of the call 'Global Environmental Changes and Societies' (GEC&S). In two years, 111 projects were submitted and 24 were selected for funding, including more than one-third led by social sciences or humanities. This encouraging result contributed to the evolution of an international program and funding within the context of the Earth System Sustainability Initiative (ESSI).

Encouraging research on the most vulnerable zones and at a regional scale

Environmental changes are closely interlinked from the smallest scales in time and space where changes have become perceptible within a few generations, to the scale of the entire planet. All six ANR calls speak of 'vulnerable areas' and 'regional approach'. Nevertheless, the spatial priorities of the calls have varied over the years. The 2006 and 2007 editions named some vulnerable systems (watersheds, coastal areas, insular areas, Mediterranean basin, polar regions (because of the International Polar Year), the Sahelian zone, monsoon areas, upwelling systems, areas with little water or poor soils) whereas VMCS did not mention any. In 2009, researchers were encouraged to take 'an integrated approach to global environmental changes that raised regional or local challenges'. The identification and quantification of the processes spreading global changes between the different environments of the earth were seen as a very important scientific challenge. The GEC&S call for proposals were the most specific about the definition of a region. Overall, as can be seen in Table 2, out of the 75 selected projects, 43% focused on France (including overseas territories) or on Europe as a whole. These projects focused mainly on alpine regions and urban systems. Outside Europe, 43 projects focused on other continents or were global. These projects focused their research on vulnerable zones of Africa (Sahara, Sahel), the Mediterranean bas and the Polar areas. In South America, two projects focused on Brazil and one on Peru. A 'global approach' was emphasized as of 2009, and the response was good.

Encouraging researchers to have a medium-term view on global change

One of the challenges of the programs was to encourage researchers to have a view on time scales ranging from 3 months to 30 years – and not to look too much at the paleoenvironmental scale or too far ahead in time i.e. over 100 years. This time scale (up to 30 years) has indeed a high societal demand but has not attracted scientific interest up to now.

Over the years, the number of projects with a 'paleo' approach has diminished, while recent historical reanalysis has increased to capture human-environment interactions.

Table 2. Classification of the projects according to their geographical focus.

Zones	2006	2007	2008	2009	2010	2011	Total	%
Global	0	0	0	2	2	1	5	7
Africa	4	0	4	0	1	4	13	17
South America	0	0	1	0	0	2	3	4
South-East Asia	0	0	0	0	0	1	1	1
India	0	0	1	1	1	0	3	4
Mediterranean basin	4	1	0	2	1	1	9	12
Europe	0	0	0	1	0	1	2	3
France	5	7	8	1	5	2	28	37
French overseas territories	2	0	0	0	0	0	2	3
Antartic	1	3	0	0	0	0	4	5
Arctic area	1	2	0	0	2	0	5	7
Total	17	13	14	7	12	12	75	100

Some ethical issues raised by the ANR-funded projects

Governance of climate change

A number of projects have focused on the governance of climate change at the global or local level. Some were focused on that topic alone, others – and these are more innovative – included studies of governance in projects where the contribution of climate specialists was important.

Co-construction: linkages between researchers, local managers and decision-makers

In 2011, during the preparation of the following program it was noted that:

> The scientific knowledge of the state of the environment, of the impact of a particular human action, is of no consequence unless society is informed, understands, feels concerned by this scientific knowledge, and puts in place decision mechanisms that take into account the facts, their likelihood of occurrence, the trade-offs between short-term benefits and long-term effects, and finally the fulfillment of society's ethical, philosophical, social, political and economic goals.

The programs have managed to bring forward projects with partnerships between researchers on the one hand, and local farmers, land managers and decision-makers on the other, and facilitate community development. Sharing the objectives of the research projects and their expected outcomes greatly facilitated collaboration and lessened project-related tensions. Working at the scale of a water basin facilitated cooperation.

Adaptation and human behavior

During the conference on 'Ethics and climate change' (Abel *et al*., 2009), Jean-Michel Besnier insisted on the importance of restrictive measures and micro actions at local scale. The sum of individual actions will have a global impact. One of the selected projects: 'Encouraging environmentally responsible behavior. Integration of economic and psychological approaches' (INCRESP), seeks to determine the basis for the 'psycho-economic engineering' of responsible behavior towards the environment and to build up a team of researchers in economy and psychology who can contribute to behavioral environmental economics.

Ethical issues in research protocols

For the moment, ANR does not have a procedure for examining ethical issues raised by the research projects and their protocols. A certain number of 75 projects selected use questionnaires. In the course of this research we found projects that send questionnaires to vulnerable populations that do not take sufficient precautions as far as getting informed consent, respecting confidentiality, and communicating results. More attention should be paid to these aspects. Further, in its programs, ANR encourages transdisciplinarity, an approach which is extremely important for the study of complex systems. It requires particular attention to research integrity as each discipline loses its specific criteria and rules, and this may lead to problems in the medium or long term.

Conclusion

Programming and carrying out research on climate and environmental change requires a continuing reflexive attitude. Research institutions and teams, individual researchers, funding agencies and politicians, all share legal, economic, social, environmental, political responsibilities and above all responsibilities to mankind for the research being carried out. Joseph Rotblat, winner of the Nobel Peace Prize in 1995 with the Pugwash conferences on science and world affairs wrote (2004): 'The basic human

value is life itself; the most important of human rights is the right to live. It is the duty of scientists to see to it that, through their work, life will not be put in peril, but will be made safe and its quality enhanced'.

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Examining the inclusion of ethics and social issues in bioscience research: concepts of 'reflection' in science

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Abstract

Research and technology development is increasingly accompanied by a form of participatory technology assessment. These processes often encourage scientists to demonstrate reflection on the wider social and ethical implications of their research, and encourage engagement with stakeholders and the wider public. A notable body of academic research has resulted in the development of new 'tools' and proposals for when these should be used (e.g. upstream engagement, participatory methods, etc). However, there still appears to be conflicting views on what tools should be used, when they should be used and by whom, as well discussions of what is and should be the value or 'impact' of these processes. There are a number of reasons why there appears to be disagreement over these issues but one notable contributing factor may be that it is often unclear what actually constitutes ethical and social reflection in practice. In addition, little appears to be known about the views of a significant set of practitioners, the scientists, who are being asked to 'reflect'. In addition research funders are requiring further processes to be embedded, such as the impact agenda. In light of these issues it is important to get a better understanding of these activities. This paper will (1) initially review some of the history and drivers for these processes, using the UK as a case study; and then (2) go on to examine important elements of the reflection and engagement 'toolbox'; before finally (3) setting out a series of questions that need to be further examined using bioenergy as a case study.

Keywords: ethical reflection; bioenergy; science and society; participatory technology assessment

Introduction

Research and technology development is increasingly accompanied by a form of participatory technology assessment (Anonymous, 2010). These processes encourage scientists to demonstrate reflection on the wider social and ethical implications of their research and encourage engagement with stakeholders and the wider public. For example, the major funder of bioscience research in the UK, the Biotechnology and Biological Sciences Research Council (BBSRC), refers to this as 'science in society' and divides researchers' consideration of ethical and societal implications of research within the biosciences into categories of (1) public engagement; and (2) activities that are associated with a notion of 'reflecting' on societal and economic implications (BBSRC, 2011, 2012a). A notable body of academic research has resulted in the development of new 'tools' and proposals for when these should be used (e.g. upstream engagement, technology assessment tools, midstream modulation, etc). However, there still appears to be conflicting views (e.g. Delgado *et al*., 2011; Fisher, 2011) on what tools should be used, when and by whom, as well discussions of what is and should be the value or 'impact' of these processes.

In order to aid the examination of the important questions around forms 'reflection' and 'engagement' it is important to firstly map different views of these activities. This paper will (1) initially review some of the history and drivers for these processes in the UK (as a useful example); and then (2) go on to examine elements of the 'toolbox', delineating some of the current processes for enabling ethical and social reflection; before finally, (3) setting out a series of questions that need to be further examined, proposing bioenergy research as useful case study.

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Inclusion of ethics and social issues in bioscience research: past and present drivers

The management of ethical dimensions and social issues raised by scientific research has been woven into scientific (and technological) governance (Irwin, 2008) across Europe for more than 10 years. These policies effectively call for both an engaged citizenship and set of practitioners able to consider the implications of research (Fisher, 2011). Numerous scientific institutions have enacted policies that require scientists to 'engage' in different forms of 'reflection' about their work, including: European Commission (2011), national governments (DIUS, 2008), research funders (RCUK, 2010) and national academies (Royal Society & Royal Academy of Engineering, 2004). In the UK, BBSRC 'aims to enable researchers to be reflective about issues raised by their research, and take part in dialogue with public and stakeholder groups' (BBSRC, 2012b). Noting this current context it is valuable to examine the historical drivers of institutional policies, before examining definitions of engagement and reflection and mapping the methods used.

The scientific community has been encouraged to 'talk about' its research, such as aims and social contribution, since the middle of the Twentieth Century. However, significant change has occurred around the notion of responsibility in science, the form that such interactions with society should take, as well as the content of such interactions. Originally, interaction took the form of communication used as a strategy to bolster public support and reduce concern, for example as seen in the context of molecular biology in 1960s / 70s USA (Wright, 1994). In the UK, the publication of the Bodmer (1985) report by The Royal Society signified a noticeable shift in the discourse surrounding science and society policy. This report legitimated communication to wider society, even going so far as to place it 'as a professional responsibility of all scientists' (The Royal Society, 1985). This period also saw the introduction of institutional structures to support and encourage scientists to contribute to 'the public understanding of science' such as the Committee on Public Understanding of Science (CoPUS) as well as funding being made available from the UK Research Councils (Miller, 2001).

It is important to recognise that the discussion around molecular biology in the 1960s was framed in technical terms of perceived health risks stemming from technical uncertainty. There was a clear sentiment that the scientific community must be seen to be addressing these risks to maintain autonomy and research momentum (Kurath and Gisler, 2009); public concerns could unnecessarily impede scientific progress. Thus, although risks were acknowledged, the central 'problem' was that the 'public' had misunderstood the science consequently did not have the capacity to make informed assessments of the risk. Such a characterisation assumed that with a more comprehensive understanding of science, the public would make similar assessments of risk and therefore scientists would continue to be trusted to make such assessments; self-regulation would be the status quo. This reasoning demonstrates a fundamentally instrumental rationale (Stirling, 2008) for considering the ethical and social implications of research, institutionalised in the UK in the 1980s and is still observed in part today.

In the late 1990s and beyond, a greater acknowledgement of differences in ethical perspectives and the nature of scientific knowledge production facilitated a shift away from advocating the sole use of communicative approaches and saw the introduction of new forms of interaction. For example, this was discussed as a 'new mood for dialogue' by the House of Lords Select Committee on Science and Technology in their report 'Science and Society' (2000). Alongside this in the UK, a review of the regulatory framework surrounding biotechnology (Cabinet Office & Office of Science and Technology, 1999) lead to the establishment of a range of new committees (e.g. Agriculture and Environment Biotechnology Commission), and calls for greater 'upstream engagement' around new developments in the biosciences (Wilsdon *et al*., 2005).

With that said, 'managing public concern' is still, in part, synonymous with 'ethical and social implications'. This has resulted in institutional methods that place the public as the problem and / or the focal point of activities. Such a conception of ethical and social implications has been critiqued in the past on an epistemological level, this work highlights the value of different forms of expert knowledge (Irwin and Wynne, 1996), and the role this plays in the production of 'socially robust knowledge' (Nowotny *et al*., 2001). The institutional drive for scientists to participate is currently very strong, despite a lack of clarity on what form of 'activity' is the most appropriate and effective when attempting to identify and manage the ethical and social implications of scientific research. In order to respond to this need for clarity, it is important to examine some of the current practices in an attempt to determine what the different tools cite as 'the problem' and 'the solution'.

Existing tools and new approaches

It is not possible in this paper to examine and comment on every reflection and engagement tool; however it is valuable to focus on those commanding a significant place within the current UK 'toolbox'. Within the current suite of methods used to consider the ethical and social implications of research, participatory approaches, which require engagement with a wide range of actors, are perhaps the most prominent. These approaches have been widely used by scientific institutions as a way of demonstrating responsible science. Distinguishing between different approaches is challenging as factors that determine their use and the normative assumptions of each approach are often implicit. Three forms of engagement are discussed below.

Public engagement

Having evolved from the Public Understanding of Science (PUS) agenda, Rowe and Frewer (2005) define public engagement as a form of governance which aims to include members of the public in policy decision-making. In this instance, public engagement can be sub-divided into communication, consultation and participation based on the direction of information flow (e.g. from policy-maker to public). Additionally, public engagement is commonly tied to models of democracy – the rationale being that democratic processes should be as inclusionary as possible – and has been suggested to be comprised of a wide range of activities in a range of institutional spaces, which may include consensus conferences, citizens' juries, deliberative technology assessments, and deliberative polling (Tlili and Dawson, 2010). However, this construction of public engagement within science is not universal, with individuals discussing public engagement as synonymous with 'popularisation' and in terms of 'communicative genres', something that can naturally occur or can be formalised (Bauer and Jensen, 2011). Unsurprisingly, in the context of public engagement notions of 'the problem' and 'the solution' vary widely, often corresponding to the specific rationale for public engagement (Stirling, 2008). Despite this, the prevailing sentiment within discussions is that 'the problem' is scientists' need to fully account for the plurality of views present throughout society, which cannot be done through traditional communication methods, with 'the solution' being that the 'public' should be involved, consulted and engaged with at all stages of the research process in order to make the process more democratic and open.

Upstream (public) engagement

Criticisms of a multitude of institutional public engagement exercises such as *GM Nation?*, in the early 2000s, lead to proposals of new forms of 'upstream engagement' (Wilsdon *et al*., 2005). In these proposals, the problem of previous attempts by institutions to address public concerns with science and technology was a lack of practical translations; institutional responses still resulted in closed-down discussions framed in terms of technical assessments of risk. Although there had been a shift in rhetoric, the cultural change had not followed. The solution was that an attitude of responsibility to

consider and debate the driving values and motivations of science through reflexive practice needed to be instilled within scientific establishments (i.e. upstream engagement) which would enable the shaping of 'technological trajectories' and consequently avoid technological determinism (Rogers-Hayden *et al*., 2007). In practice this appears to have been translated into a form of upstream public engagement, where engagement of major scientific institutions with the public has been encouraged at scientific-research-stages rather than technological-development-phases of research, such as in the context of Synthetic Biology and Nanotechnology. Although this procedure occurs at an 'earlier' stage in the technology development process, in practice its central tenet appears to have been translated into public consultation.

Encouraging reflexivity: midstream modulation and collaboration

Attempts to encourage collaborative research between social scientists, ethicists and scientists with the explicit intention of moving ethical and social reflection directly into the scientific programmes are emerging in the UK. Such programmes have a range of proponents and are wide-ranging in their specific methodologies, referred to under terms such as collaborative research, 'convergence' (Stegmaier, 2009), 'midstream modulation' (Fisher *et al*., 2006), and 'post-ELSI' (Rabinow and Bennett, 2009) to name but a few. Such tools have emerged in part as a response to some of the major criticisms of both traditional ELSI programmes (Marris and Rose, 2010) and upstream engagement, namely that previous instances have provided little evidence of changing scientific practices (Fisher, 2007). On a broad level, these collaborative tools appear to place an absence of ethical reflection in the 'ethos' of science as the problem (Schuurbiers, 2011; Ziman, 1998) with an assumption, on the part of all proponents – research funders, scientists, social scientists and ethicists alike – that collaboration will foster reflexivity around the underlying values and norms that direct scientific research.

Institutional responses and key questions

After gaining some insight into the types of tools that are used, further questions need to be asked as to how these tools are used in practice, both in terms of outcomes and expectations. Many research councils across Europe are both drivers of change and frontline responders to calls for more embedded reflection on the wider social and ethical implications of research. Exploration of this, the nature of conflicts over tool-choice, and uncertainties around when they should be used and by whom, would be aided by a specific case study.

A topical and complex, and hence valuable, case study is bioenergy research, more specifically examining current research council governance mechanisms for identifying and managing social and ethical implications within this research field. Using the UK as national example, documentary analysis has initially established that the UK Biotechnology and Biological Sciences Research Council (BBSRC) encourages reflection relating to bioenergy using at least four tools at three points in the research process: (1) ethical review and impact statements prior to funding decisions; (2) on-going public engagement; and (3) an increasing willingness to fund interdisciplinary research with social scientists and ethicists. It is claimed that ethical reflection also extends beyond the formalised, 'top-down' mechanisms highlighted by the documentary analysis; wide-ranging reflection is inherent to the scientific process (Schuurbiers, 2011). Consequently, informal day-to-day considerations of this sort may or possibly should provide valuable spaces for consideration of the ethical and social implications of research, which are often overlooked during the development of 'participatory tools'.

Examining the nature of these processes is of particular interest with the backdrop of a new research assessment mechanism, embodied by the 'impact agenda' of RCUK (2011). Despite being renegotiated solely away from 'economic impact' by the Research Councils (Kearnes and Wienroth, 2011) so that

'societal impacts' are included in the reporting, it is not clear if this agenda is operationalizing the imperative for social responsibility (Ziman, 1998). It is entirely possible that it will further focus research agendas on maximising specific demonstrable social and economic returns, in line with current developments (Demeritt, 2010), possibly marginalising opportunities for informal reflection.

This UK example highlights the challenges faced by scientific research institutions and individual scientists when they attempt to respond to the so-called 'science and society' agenda, making it an important research case study. Therefore the current activities and future needs could be explored through the following questions: (1) How do different stakeholders construct ethical and social reflection / engagement as a part of research activities; (2) Are the major stakeholders working to commensurate notions of ethical and social responsibility; (3) What are the implications of any divergence in views; and (4) How do these constructions fit with academic and wider notions of ethical and social responsibility in science?

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Biochar for smallholder farmers in East Africa: arguing for transdisciplinary research

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Abstract

Pressing challenges of the 21st century need adequate response of science! This claim is not just a question of working on urgent and relevant questions. This claim calls for new approaches in science. According to the proverb 'The world has problems, universities have faculties' – we have to overcome traditional boundaries of disciplines. Moreover we have to transgress the confinement to the ivory tower and invite the persons affected and potential future multipliers into the process of research. This need for transdisciplinary research and both its opportunities and challenges will be highlighted by introducing a holistic biochar approach for smallholder farmers in East Africa. Two decades after the re-discovery and scientific description of the extremely fertile and long-term carbon storing Amazonian Dark Earths, there seems to be a 'black gold rush'. Charcoal used as a soil amendment (biochar) might reproduce such soils. Small scale biochar production and its application to the soil offer opportunities for improvement of both human health and soil properties and for food security, climate change adaptation and mitigation especially in East Africa. But still these sound pre-conditions and even excellence in science do not guarantee success in terms of a benefit for farmers. A lot of work needs to be done to transform those multiple chances into a true solution. It will require a transdisciplinary and interactive form of development cooperation and research – a true cooperation between local farmers, organizations and willing researchers.

Keywords: cooking stoves, charcoal, soil fertility, sustainability science

The biochar concept

The discovery of black and extremely fertile soils in the Amazon Basin (e.g. Woods and McCann, 1999) caused euphoria about the possibility of a carbon negative, organic but still highly productive agriculture. This so called Terra Preta do Indio (Portuguese: 'Dark Earth of the Indians', Amazonian Dark Earths – ADE) is an anthropogenic soil with significantly higher agronomic potential than adjacent non-anthropogenic soils (Lehmann *et al*., 2003). ADE contain pieces of charcoal with a ^{14}C – age of 1000 to 1,500 years and other traces of human activity and input (Glaser, 1999).

The so-called biochar concept of using charcoal as a soil amendment wants to reproduce soils with similar characteristics and potential productivity. Biochar is defined as charcoal 'manufactured for the deliberate purpose of applying it to the soil' (Clough and Condron, 2010). In current research projects it is produced rather by hydrothermal carbonization (wet process with no oxygen at ~200 °C and up to ~20 bar, used e.g. by Steinbeiss *et al*., 2009) or by pyrolysis (dry process with no or low oxygen, mostly <700 °C at atmospheric pressure, used by most studies cited below). Both processes are exothermic, i.e. most implementations of those processes just need an activation energy and some even perform a net production of energy as constructed by Sehn *et al*. (2010).

Biochar research is still very young, e.g. in 2006 just 5 peer-reviewed paper were published including the term 'biochar', whereas is 2011 already 207 papers can be found according to a search on scopus.com. Recent results already showed improved water holding capacity in biochar amended soils as shown by

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Uzoma *et al*. (2011), improved nutrient retention as shown by Lehmann *et al*. (2003) and enhanced nitrogen fixation as reviewed by Clough and Condron (2010) and enhanced microbial activity as shown e.g. by Steinbeiss *et al*. (2009). Moreover, according to Woolf *et al*. (2010) a global biochar approach could mitigate up to an order of magnitude of 12% CO_2 equivalents (potential technical limit) of annual global greenhouse gas emissions without interference with food production and nature preservation.

But still, there are many open question, e.g. about the role of micro-organisms or the transferability of lab results to the field. The latter was questioned e.g. by Jones *et al*. (2012).

Key problems in East Africa

The 2011 famine in Somalia, Ethiopia and some other parts of East Africa (Zarocostas, 2011) is a symptom of various problems. According to the Food and Agriculture Organization of the United Nations (FAO, 2000) these include climate change (increased frequency and intensity of droughts), severe soil degradation due to fragile ecosystems and population growth combined with poor agricultural practice due to a lack of education.. They also highlighted the important role of poor health, weak governance and insufficient infrastructure.

To work on agricultural problems in this socio-economic and political context, solutions must be low-tech and applicable at small scale to reduce dependence on any kind of infrastructure. Not only new possible solutions are needed, but also new ways to test and to implement them.

A possible solution: a holistic biochar approach

The key advantage of the biochar approach is the possibility for a small scale production in pyrolytic cooking stoves (gasifier stoves). These stoves can be produced locally at rather low costs and fuelled with traditional firewood as used on a three stone stove. But pelletized waste biomass of subsistence farmers is suitable, too (Roth, 2011). Thus, it can be a cheap, low-tech and highly decentralized solution to several problems:

- by reducing indoor air pollution by using low emission pyrolytic (charcoal producing) stoves for cooking (MacCarty *et al*., 2010);
- by Reducing deforestation due to the high efficiency of pyrolytic stoves (Roth, 2011) and the possibility to use alternative fuels like pellets from Cashew nut shell or sawdust (Panwar, 2009);
- by Climate Change adaptation through improved soil properties as described above;
- and in this way increasing yields of both food and cash crops and reducing the dependence on agricultural inputs and on charcoal for cooking purpose.

This means, that even if biochar turns out to be poor or even useless soil additive – in general or case specific in the respective combination of the stove-produced charcoal and local soil (cf. Steinbeiss *et al*., 2009) – this approach is still beneficial as benefits e.g. for indoor air quality are already shown and the charcoal produced still can burned for cooking purpose.

Of course, this concept still includes some risks and open questions. To mention among others:

- Although intrinsic content of heavy metals and polycyclic aromatic hydrocarbons of biochar is rather low, those pollutants could turn out to accumulate to some extend in soil and crops.
- The biochar approach could turn out to be in total is less beneficial for crop yields than cheaper methods such as slash and burn and thus be economically needless.
- Pelletizing might be not suitable on a long term basis and thus the use of firewood is manifested due to the financial investment of the stove.

The need for transdisciplinary research and its challenges and prospects

As mentioned above the FAO described the key problems for food insecurity in East Africa already in 2000, i.e. more than a decade ago. Nonetheless, the Somalia and Ethiopia famine could not be avoided. In February 2012 UN declared the end of the Somalia famine, but still there is a threat of food insecurity in this region (FSNAU, 2012). Thus, new ways in science and development cooperation need to challenge new ways to stabilize these fragile economies and agricultural systems.

But there is no time to wait for 100% safe and already scientifically proven solutions! Defining strategies for Sustainability Sciences, Kates *et al*. (2001) underlined that in important and urgent areas 'scientific exploration, and practical application must occur simultaneously'. In this case the overall risk of e.g. a biochar approach as mentioned above appears rather low compared to the urgent problem of food insecurity in East Africa. Thus, some possible solutions like biochar for smallholder farmers need to be validated and optimized in the field, not just in the lab. To get a useful evaluation and optimization, farmers and even extension service workers and similar organizations need to be involved into the research process.

Starting from this point, more questions arise (modified from Hurni and Wiesmann, 2002): Does the project really contribute to a 'sustainable development' (cf. Eser, 2012)? Which measures are most suitable to also optimize social and economic benefits? Are there more key players that need to be involved? – Addressing these relevant questions, we are moving towards transdisciplinary research.

Though there is no general definition agreed upon, substantially matching descriptions of transdisciplinarity can be found. According to Pohl (2001) transdisciplinary research must include problem-orientation, working beyond disciplinary boarders, practice-orientation, participatory elements and process-orientation. According to Bergmann *et al*. (2005) transdisciplinary research tackles problems that are relevant to society by utilizing practical knowledge in an adaptable research process. They underline that its outcomes are problem-related approaches and push both scientific and everyday discourses.

But transdisciplinarity is not easy. Integrating several disciplinary approaches into one framework is already a demanding task within the scientific 'ivory tower'. It gets more difficult when 'non-scientific' knowledge and approaches are included. As an example van Asten *et al*. (2009) describe the challenges of including African farmer's knowledge in agricultural research. However, this remains a necessary challenge!

> 'Transdisciplinarity is simultaneously an attitude and a form of action.' (Thompson Klein, 2004)

Outlook: a possible way to make Biochar research in East Africa a prime example for transdisciplinarity

- If a biochar approach could really work along a wide front in East Africa still needs to be shown. A possible road map for transdisciplinary biochar research could look like this:
- Developing and gradual optimizing of pyrolytic cooking stoves in cooperation with potential users and local manufacturers while maintaining a high standard in engineering in terms of emission monitoring as performed at Makerere University, Kampala, Uganda (K. Bechtel, personal communications).
- Conducting research on the properties of the charcoal produced by these stoves and its effects on soil on a lab/pot trial level including pollutant leaching.

- Convincing and training of local stove smiths to produce optimized pyrolytic stoves to set up a self-sustaining mode of distribution of the stoves (stoves are not given, but sold).
- Developing methods and models for pelletizing waste biomass as alternative fuel, evaluation of the availability of the respective biomass and defining sustainability criteria for the use of biomass.
- Initiating farmers' field schools (cf. Leitgeb *et al*., 2011), workshops and other meetings to start a dynamic exchange of experiences and knowledge among farmers, researchers and extension services workers.
- Permanent monitoring and 'escorting' interdisciplinary research on soil properties, crop yields, health related to indoor air quality, economic benefits or losses for the users of pyrolytic stoves, socio-economic and gender effects and so forth.

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Section 15. Values for governance

Biotechnology and a new approach to a theory of values

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Abstract

The socio-economic, environmental and ethical issues, emerging from the production and use of biofuels, produced from industrial farming and growing of highyielding monocrops, will be discussed in this paper, on the basis of a novel, specific application of a wellknown general rational scheme of evaluation within the context of moral realism. Based on this specific framework, a new approach to a theory of values will be attempted; a theory which will be free from positivistic and neopositivistic features, and which will be mainly focused on neo-Aristotelian virtue ethics – properly adapted to a modern framework of needs and requirements, and also enriched with features of deontological ethics – and, thus, on values such as practical wisdom, virtuous act and responsibility, *eudemonia* (human well-being), social sensibility, integrity and substantial concern and respect for community, environment and sustainable development. So, the proposed theory, which is unavoidably based on an ontology of values and a new axiology of techno-science, will not only include immanent epistemic values, but will be of an interdisciplinary character, attaining to a unifying worldview, asymptotically gained by a Hegelian dialectical synthesis.

Keywords: biofuels, bioethics, virtue ethics, neo-Aristotelian ethics, sustainable development

Introduction

Biofuels – produced by enzymatic (e.g. bioethanol), catalytic or noncatalytic methods (e.g. biodiesel) – are currently considered as a very promising substitute for fossil fuels. So, biodiesel produced from renewable feedstocks, is a very good substitute for petroleum based diesel fuel, being, among others, nontoxic and biodegradable, having also significantly lower greenhouse gas emissions than crude oil-based diesel (Kafuku *et al*., 2011). Especially the second generation biofuels, like biodiesel, have a positive impact on biodiversity as well as land use; yet, since from the techno-economic point of view the production of second generation biofuels has much more problems to overcome, in comparison to the use of conventional technology, which is required for the production of first generation biofuels, a great amount of bioenergy production is based on food monocrops.

Nevertheless, large-scale monocropping practices, in biotechnology, are strongly associated with various socio-economic and bioethical issues, with the bioethical issues including also the ecological components (Schramme, 2002). Such issues are, for example, the major issue of the 'food vs. fuel' debate, the poverty, malnutrition and famine issues, the loss of biodiversity, the deforestation and soil erosion, the threat of great emigration currents, and the monocropping control by transnational corporations (Wikipedia, 2011). The complexity of all these arising problems is obvious and can not be easily clarified; still, we have no right to play Russian roulette with people's lives and put in danger the existence and welfare of future generations. Unless practical wisdom (prudence) and respect for nature and future generations are put in place, as many reliable scientists and international food and international organizations argue, monocropping practices for biofule production can threaten societies and the environment.

Based on a novel specific application (Markopoulos, 2010) of a wellknown general rational scheme of evaluation (Huppenbauer and De Bernardi, 2003) within a context of moral realism, the socio-economic and bioethical issues emerging from the biofuel production, with the use of monocrops, is critically

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discussed in this paper. Within this framework, a new approach to a theory of values, mainly grounded on an ontology of values and on virtue ethics, will be attempted. The proposed theory will not be only focused on the immanent epistemic values, but will be of an interdisciplinary character and will attain to a unifying worldview. What I will argue is that we prudentially need – as it will be explained below in more detail – a new dialectical synthesis based on the negation of the explosive mixture of scientism, technocracy, economism and human hybris – which are the contemporary negative sides of science, technology, morally based economy and humility – and on the negation of this negation.

Biofuels and current socio-economic and bioethical issues

The biofuel production and use that will be critically discussed and evaluated refers mainly to industrial farming and growing of highyielding monocrops. The main issues that will be considered are the above mentioned socio-economic and bioethical factors.

Our critical discussion and evaluation, concerning various technological applications, will be expressed on a rational basis within a context of moral realism. According to this procedure, the suggested steps should include (Huppenbauer and De Bernardi, 2003):

- the analysis of the existing situation (list of the parties involved, their interests and positions);
- the analysis and characterization of moral principles and argumentations;
- the evaluation, from a moral point of view, of the posed arguments;
- the implementation of the final suggested positions.

In regard to the two first suggested steps of the evaluation procedure, the following picture results from the application of this general method to our specific biotechnological issue:

The farmers, as employers, being interested in their work and profit, are in favor of the monocropping practice. This position constitutes an anthropocentric, utilitarian view.

The farmers, as inhabitants, being against malnutrition, famine and socio-economic risks (i.e. the menace of emigration) and dependence, due to monocropping practice, are opposed to this biotechnological option. This is partly an anthropocentric/utilitarian position, and partly a socio-ethical position.

The food industries, expressing the fear of food scarcity and a great food price crisis, are against this practice. This is mainly a socio-economic position with utilitarian as well as socio-ethical components.

The fuel industries, being strongly profit oriented, are in favor of this kind of biofuel production. Their position can be characterized as strongly utilitarian.

The ecological organizations show a two-minded position; on one hand there is the possibility for greater greenhouse gas emission savings, and on the other this biofuel production and use can seriously threaten biodiversity and cause deforestation, soil erosion and degradation of water.

The environment, as an interested party itself, seems to be affected more negatively than positively. This position, mainly dictated by practical wisdom, which conclusively leaves no room for superficial actions and dangerous games with the environment, is strongly ecocentric.

As it can be clearly seen, concerning the evaluation of the posed arguments (step 3), all positions that justify and support the production and use of biofuels on the basis of monocropping practices are of a strong utilitarian nature; on the other hand, the arguments that are opposed are not only anthropocentric and utilitarian, but they are mainly associated with social and bioethical (also including

the environmental) issues. These issues are strongly related to our socio-ethical sensibility towards the problems that the farmers will have to face, as well as to the intrinsic value that the environment shall have for us, as an aesthetic value as well, disconnected from any utilitarian view.

A basic question that arises is whether the proposed argumentation and evaluation is within the context of moral realism. In order to give an answer to this question, we will proceed to the discussion of a thought experiment: Suppose that we possess perfect knowledge, and that we are sure about the coming social disturbances and disaster of societies and environment, if biofuels were to be produced by monocropping practices. How would we act? Would we give the permission for such a production and use? In this case, I think, there would be no rational person, not a single rational creature, that would give, unaffected by these calamities, her, his or it permission for such a technical endeavour. So, I argue that, against any positivistic view, the criterion of 'cognitive control' is valid and can be applied to the ethical and moral evaluation of scientific methods and applications, and to the foundation and justification of moral qualities and virtues. All these values are an objective part of reality, and are connected to a realism that is wider than an anthropocentric realism, since the existence of our rational thinking 'ideal' observer is not only restricted to the human beings. That is why, compared also with, and in analogy to scientific realism, I am speaking of an 'extended moderate moral realism' (J.N.Markopoulos, personal communications).

It is important to be underlined, that by proceeding to the above mentioned rational evaluation method, which will lead to the implementation of the finally proposed views and options, we already find ourselves within an ethical and moral context of deliberation and action; we have already made a moral choice. Yet, such a choice can not be taken easily, especially when scientism, technocracy, economism and, finally, a positivistic and pragmatic view prevail over ethically and morally grounded science, technology, economics and a substantial, holistic and unifying view in world-politics, world-economics and scientific and educational institutions.

Within this positivistic, neo-positivistic and pragmatic framework, the only accepted (valid) values are more or less instrumental and epistemic values. These values are mainly the objectivity of knowledge, the accuracy of scientific work, the utility and exploitation of knowledge and methods, the efficiency of a method or a technical application, the linguistic simplicity and clarity, and the demand of the verification, or, later on, the falsification principle. All these epistemic values are not of minor importance, and they surely make a major contribution to the enhancement of technoscience. Still, it must be emphatically noted, that reality is much more complicated and can not be easily understood and changed based only on a so poor and unproductive view (Markopoulos, 2007).

So, it is no wonder why positivistic, neo-positivistic and pragmatic thought replaced the Aristotelian ontology of values with facts and relations. In this way, as philosophical thought proceeds from the metaphysics of being to the metaphysics of experience, without any reference to an ontology of values, the domination of the speculative thought by the scientific intellect is required (Ayer, 1959). Furthermore, there is a current philosophical conflict, within the context of naturalism, between a philosophy of experience, based on the idea of the 'process of change', and a philosophy of being, based on the idea of permanence, and thus on invariant and perennial values. This conflict had a subsequent influence on ethical thinking, and, thus, on philosophy of values (Anton, 2005).

Since this positivistic and pragmatic worldview is developed and applied within the framework of a strongly antagonistic and utilitarian society – and, thus, of a similarly organized political, socio-economic, techno-scientific and educational enterprise – it easily leads to practices that can be characterized by lack of integrity, transparency and serious concern for society and environment; it leads to social conditions that do not easily promote and truly support moral choices and right actions. For this, we need another

way of thinking and acting; we need a new approach to an axiology of science and technology; a new approach to a theory of values.

Biotechnological processes and a new theory of values

The new approach to a theory of values, suggested here, is expressed within a neo-Aristotelian framework, which is, nevertheless, enriched with features of deontological, Kantian ethics. Aristotelian virtue ethics (Aristotle, 1993), with its key-qualities and values, like practical wisdom, or *phronesis* (the virtue of prudence), moral virtue, virtuous and responsible citizen, right action and human well-being (*eudemonia*) shall now have new interpretations as they will be adapted to modern theoretical and practical demands.

According to Aristotle, moral virtue – which is the mean for achieving *eudemonia*, and is unbreakably bound to moral action – is an intention, a character trait related to rational choice and act, and it consists in trying to achieve the mean relative to us, on the basis of a rational principle, that a man of practical wisdom would define it as such. So moral virtue presupposes practical wisdom, on one hand, and practical wisdom is based on moral virtue, on the other.

Since Aristotelian ethics is socially oriented, and Aristotle's politics ethically grounded (Ross, 1991), virtue ethics can be considered as a very suitable theory to face contemporary bioethical problems arising from the rapid, uncontrolled technological development and new technologies, like biotechnology. Furthermore, and compared with its two rivals, utilitarianism and deontological ethics – which are act-centered – virtue ethics is mainly focused on the agents character evaluation (agent-centered). In my opinion, these characteristics make virtue ethics an essential and useful tool for moral evaluation and moral guidance – particularly concerning scientists' and engineers' character traits and doings – and through this for the critical discussion and evaluation of their doings.

Almost within a neo-Aristotelian context, practical wisdom is considered as a supreme virtue in medical practice and as a basic methodological pathway regarding the current pressing problems in medical ethics (Thomasma, 2007). Environmental virtue ethics is also concerned with the justification and defence of 'the green belief' in virtue ethics terms, rather than in terms of utilitarianism and deontology (Hursthouse, 2007). As Hursthouse notices, this can happen either by using a new interpretation of the basic theory concepts or by introducing 'one or two new virtues, explicitly concerned with our relations with nature'. Such virtues, expressed as virtue character traits, could be 'the putative virtue of being disposed to feel the emotion of wonder', regarding our relations to nature, and the 'respect for nature'.

It is noteworthy, that Rosalind Hursthouse is seriously concerned about the effectiveness of a human-centered virtue ethics, which will consider *eudemonia* a top value that a virtuous human being should seek. Yet, she still things that, as grounded in Aristotelian ethics, the new proposed virtues also presuppose the existence of practical wisdom (prudence), in such a way that anyone who possesses prudence, possesses all the other virtues as well, and knows what to do in different circumstances.

It is obvious, that dealing with the contemporary, very complicated bioethical issues, concerning biofuel production and use, and biotechnology in general, the exercise of practical wisdom, as well as its new interpretation and application within the complex and not always transparent socio-economic and techno-scientific environment, is a difficult task, which shall be undertaken on a new socio-technological, educational and ethical basis.

With regard to the Aristotelian concept of *eudemonia*, on the basis of practical wisdom, I believe it must be emphasized, in my opinion, that any new interpretation of it, should necessarily take into consideration the current demand for a human well-being that will be grounded on a sustainable development, which

will also respect the well-being of future generations. The fulfillment of such a demand – with its social, bioethical and economic components, as well as with the appropriate knowledge and decisions – doesn't only provide a more completed, substantial and 'updated' interpretation of the concept of *eudemonia*, but also moderates, if not fully eliminates, as I see it, the 'stigma' of a human-centered theory, since this new interpretation has rather a biocentric than a human-centric orientation. In this point of view, the concept of human well-being is even more disconnected from utilitarian semantic connotations, acquiring, in this way, a more substantial meaning that is now more clearly referred to well-informed and well-acting virtuous citizens, and not only to consumers.

And here we come to the close of the circle; to the Aristotelian concept of the virtuous citizen of the ancient Greek 'city-state'. In a restricted and more specific framework, the Aristotelian virtuous 'city-state' and democracy, consisting of virtuous citizens, will now become, in our case, a virtuous scientific community, consisting of virtuous scientists, who, combining intellect and character, will show 'practical wisdom – the capacity to reason correctly about what is to be done – which itself involves reasoning in relation to good ends' (Hursthouse, 2007).

So, within the above mentioned and critically discussed neo-Aristotelian approach to a theory of values, which is, in its essence, a theory of new interpreted virtues, the arising problems from the production and use of biofuels can be critically faced. Based on the reinterpreted concepts of practical wisdom, moral virtue, rational thought and choice, virtuous citizen and *eudemonia*, the problems of malnutrition, famine, deforestation and soil erosion, ecological disaster, poverty, dependence and emigration can be critically discussed and efficiently faced. Virtue-ethical theory can be completed with some new virtues, such as humility, and the capability to feel wonder and respect for nature. Scientists' responsibility (Jonas, 1985) toward society and environment, as a value for the technological age, can be also regarded as a character trait, a quality, of virtuous scientist, in the neo-Aristotelian sense. Moreover, the movement for a 'Global Ethic' (Weltethos), on the basis of a theologically articulated idealism, considers scientists' responsibility, and, thus, the morality of responsibility, as a necessary presupposition for a substantial and effective valuation of a techno-scientific enterprise that shall aim at sustainable development (Mack, 1998).

For a more efficient confrontation with these issues, virtue-ethical theory can be supplemented with some characteristic virtues from Kantian ethics, such as autonomy, integrity and respect toward human beings (Driver, 2007). All these qualities, and especially the neo-Aristotelian virtue-ethical values, shall be based on an ontology of values and a new axiology of technoscience.

The proposed theory, will not only include immanent epistemic values, but will be of an interdisciplinary character, attaining to a unifying worldview. This can be achieved by a Hegelian dialectical synthesis. In this aspect, the present technocratic and neo-liberal development model represents a thesis, which already has shown, besides its positive contribution, some very serious socio-economic and bioethical issues. So, an antithesis to this thesis is dialectically required, proposed by the new axiology of techno-science and the new theory of values, which practically represents a dialectical negation of the explosive mixture of scientism, technocracy, economism and human hybris, which are the contemporary negative sides of science, technology, morally based economy and humility. The final step of dialectical synthesis, in general, can asymptotically be achieved (Wuchterl, 1998), within a socio-historical perspective, by the negation of the negation, trying always to synthesize the main characteristics of all previous steps.

Conclusion

In this paper I argue, that the socio-economic and bioethical issues emerging from the use of biofuels, produced with large-scale monocropping practices, can be critically discussed and efficiently faced

within a framework of moral realism and a new approach to a theory of values. The proposed theory is mainly based on a neo-Aristotelian virtue-ethical theory, supplemented by some characteristic values from Kantian ethics. An ontology of values and a new axiology of technoscience are significant parts and presuppositions of the proposed theory, which, being of interdisciplinary character, attains to a unifying worldview that can be asymptotically gained by a Hegelian dialectical synthesis.

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Towards a value-reflexive governance of water

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Abstract

Climate change, agriculture and food production are closely interlinked by the issue of water. While heavy precipitation events destroy yields and land, adaptation and mitigation measures to counter climate change might themselves put stress on water resources. Managing water can help to manage climate change consequences. So far, there exists much instrumental knowledge on how to technically deal with water issues. In spite of that, many management approaches fail mainly because they ignore the political dimension of water management processes. This failure concerns issues of rule-setting and rule-enforcement but also the question of values. This paper draws on results of the FP7-EU project 'Value Isobars', especially of a part elaborated by the authors. It will be argued that a more value-reflexive governance can contribute to overcome some of the shortcomings in current water governance. It suggests (1) value-dialogue as a low-threshold entry into ethical questions of water governance; and (2) an ethical approach to deal with values in an argumentative way. The paper does not elaborate specific methods for deliberation and participation but aims at giving the choice and design of such methods an ethical grounding.

Keywords: water, governance, values, ethics, participation

Effects of climate change on water, agriculture and food production

'Climate change, energy and food security, economic development – in the end, it all trickles down to water.' (Steduto and Kuylenstierna, 2009) This statement of leaders of UN water highlights the cross-cutting nature of the water issue. Water relates to and links most spheres of activities that feature centrally in the debate for sustainable development: food and agriculture, protection of natural resources, energy, sanitation and health, economic development, etc. Addressing the water issue also means addressing many other connected problem areas at the same time. So far, from a global perspective, fresh water is not scarce and it is renewable. However, distribution of and access to water is unequal and unfair and hence regional scarcity has already become a major issue. Enforcing a right to water constitutes a Herculean task in itself.

Now, climate change comes into play and puts further stress on freshwater resources. Impacts of climate change on water can not be comprehensively discussed within the scope of this paper. However, some effects for food and agriculture will be pointed out (Parry *et al.,* 2007, Bals *et al.,* 2008):

- Rising temperatures and heat waves will put stress on water and water supply. There will not only be an increasing demand for water, but also quality problems e.g. due to algal blooms. Especially, water resources that depend on snow fall will be vulnerable. Higher temperatures will decrease and damage yields in warmer countries and thus affect people that are already worse off now. Droughts result in land degradation and livestock starving and death. Increased water temperature also will affect fish stocks.
- Extreme weather events such as heavy precipitation or more intense tropical cyclones adversely effect the quality of surface- and groundwater and may contaminate and disrupt public water supply. Water logging and soil erosion resulting from those events will have severe consequences for agriculture.
- Sea level rise will lead to salinisation of water and soils.

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As mentioned before, water interlinks many issues. Stress on water due to climate change does not only adversely effects food security and agriculture but also among others sanitation and health, energy or economic activities. They all compete for water resources and thereby aggravate the impact of climate change on water (Bals *et al.,* 2008). Measures to cope with climate change and to bring about a more sustainable development also affect water (Steduto and Kuylenstierna, 2009). Mitigation such as the production of renewable energy needs water for power plant cooling, pump storage hydro power stations or growing bioenergy plants. Adaptation requires water resource management to meet diverse water needs. However, because of this central role of water, it is not only the weak point on the way to a more sustainable world, it can also be seen as the starting point to address many sustainability issues and to cope with climate change. In that sense, both water governance and an 'ethics of water (governance)' are at stake.

Water governance: bringing politics back in

The academic literature agrees that water should not be left unmanaged. Because of the cross-cutting nature of water, addressing water issues opens up opportunities to deal with effects of climate change on e.g. aquaculture or agriculture. Steduto and Kuylenstierna (2009) hold the view that '[if] we manage water, we can, to a large extent, manage climate variability and thus also be better prepared for climate change.' As unmanaged water is seen to be most vulnerable to climate change, leaving water without regulations also poses severe normative challenges. First, poor people in the South are especially endangered by climate change and its effects on water and they are restricted most in their chance to development. Thus, by applying the principle of intragenerational justice Bals *et al.* (2008) call for improved water management as a means for long term availability of water. Second, according to the Rio Declaration, sustainability should guarantee peace next to economical development and environmental protection (Rio Declaration, 1992, principle 28). As the struggle for water is very likely to become a major trigger for so-called climate wars in the near future, water management is urgently needed – and it can be observed that water is becoming an issue of cooperation between nations (Faeth and Weinthal, 2012, Welzer, 2010). Finally, refraining from water management might hand over the field in organisational terms to the 'Iron Law of Oligarchy' predicting 'that when left unstructured and unorganised, specific interest – those that can reap selective benefits [...] – inevitably will capture and come to dominate the process' (Pahl-Wostl and Toonen, 2009a). This raises socio-ethical questions with regard to emerging power relationships and institutional settings as well with regard to the legitimacy of decision-making.

Though there are numerous scientific, technological and policy approaches to deal with water issues, actual results seem to be disappointing. Reasons for failure are diverse and cannot be discussed in detail here (cf. Ingram, 2008). We will instead focus on water politics and governance. After being long neglected by water scholars and practitioners, the political dimension must be seen as an indispensable component for sustainable innovations in water science and governance (Ingram, 2008, Pahl-Wostl and Toonen, 2009a). The following section briefly illustrates why it is reasonable to distinguish between management and governance and then sketches some requirements for a sustainable water governance.

According to Pahl-Wostl and Toonen (2009b) management 'is about achieving goals, with given means and resources, within given constraints and preferably in a "cost-effective way"', while governance 'is about setting the stage for management, the process of selecting policy options among competing values, translating them into goals, means and processes to be 'managed', evaluating outcomes and accounting externally, and taking responsibility for choices made along the way'. Having predominately concentrated on the management and technology side, it is exactly within the water governance dimension where previous approaches to water problems have had their shortcomings. While management strives after effectiveness and efficiency, governance intents to create legitimacy. Making water policies more

efficient and effective does not make them more legitimate and socially accepted at the same time when distributional effects or cultural factors are ignored (Ingram, 2008).

What follows from that insight for water scholars and practitioners? Sustainable water governance needs to fulfil several tasks, namely unfolding and settling value differences, finding legitimate policy solutions, dealing with uncertainty and surprise due to climate change and finally finding ways and means for policy implementation. With regard to reforms of water policies, two aspects seem to be undisputed. First, panaceas or universal solutions that are supposed to fit all situations independently of time and space are deemed to fail. Contextualised solutions are needed (Ingram, 2008; Ostrom, 2007). Second, many actors on different social levels ranging from the local to global can contribute to counter climate change and to find sustainable solutions to water problems. Their interaction can be steered by different social mechanisms such as competition, hierarchy or cooperation (Ostrom, 2007, 2010; Pahl-Wostl and Toonen, 2009a).

Accepting these two aspects, social science studies on sustainable water governance can be improved by both combining the governance approach with insights from policy analysis (Mayntz, 2009) and introducing an 'ethics of water (governance)'. While the governance approach looks for institutional settings and social mechanisms, policy analysis develops possible solutions by identifying a political problem. Describing policy problems not only requires singling out relevant actor groups, namely those who cause a problem, those who are affected by the problem and those who can contribute to a problem solution. What is also needed is an analysis of material (resources) and immaterial factors (values, cultural orientations, scientific knowledge). However, describing the problem structure of sustainable water governance can only be a start. Scholars of water governance also have to assess how to implement promising solutions in different social contexts. Ingram (2008) names important factors for successful implementation such as attracting public attention in an area with high values at stake, generating engagement and support, engaging social movements, making water governance an issue of politics and not only of expert circles and overcoming (formal and informal) bureaucratic path dependency. Finally, it is doubted that more scientific knowledge is needed in water governance. Instead different knowledge, namely one that is more credible, trusted and legitimate is suggested. It follows from the aforementioned that sustainable water governance requires value reflection on the scientific as well as on the governance side. We understand the approach of a value-reflexive governance of water as a contribution to fill that gap.

Value-reflexive governance of water

Dealing with the value dimension in water governance seems crucial as '[water] resources inherently involve value conflicts because water has very different meanings to different people in different contexts' (Ingram, 2008). It is therefore necessary to understand the very concept of value, in order to establish and clarify the concept of 'value-reflexive-governance', which transcends 'good governance' concepts, and to find ethical mechanisms to deal with value conflicts.

Concept of value

A philosophical analysis of values contributes to a better understanding of the normative (or evaluative) basis of water science and governance. We understand values as reference points of evaluations, which result from evaluation processes in a dynamic dialectic. As such they are rationally and emotionally binding, give long-term orientation and motivate for action. Individuals and social groups feel bound to their values. They can therefore be understood as strong intrinsic motivators. Acting in accordance with one's own values, individuals and groups behave in consonance with their own self-conception, in a way they want to see themselves (Joas, 2000).

Values make actions possible without directly prescribing a specific course of action. As values are not directly linked to specific actions their translation into action-commanding norms and regulations becomes necessary. Values and also value-reflexive governance open a dynamic, pluralistic as well as somewhat opaque and conflicting space of possible norms for action. Therefore, one has to proceed carefully when translating values into norms. In that sense, the importance of ethics – understood as reflection theory of morality – for a value-reflexive governance is undisputed.

Values and ethics

Ethics, that is aware of a plurality of values within and between societies, can develop mechanisms that allow citizens to bring their values and norms into ethical debates (Skorupinski and Ott, 2002). Thereby ethical discourse participates in the finding of 'socially robust innovations' (Funtowicz and Ravetz, 1993, 1999). Affirming these views, we want to further advance two value-ethical claims. First, values can be regarded as low-threshold entry to ethical debates. Considering the value dimension in situations of high uncertainties and high values at stake allows to better address citizens and stakeholders, which have to – and want to – understand, support, endure and participate consciously and deliberately in governance processes such as water governance. Second, ethical debates cannot be restricted to mere value talk. Value debates need an ethical framing that enables both participation as well as a philosophically sound reflection on (conflicting) values. Accordingly, the suggested value-reflexive approach of governance would also contribute to a democratisation of science and technology governance, to make implicit value commitments explicit and to allow for rational discourses on values. The last point is important as there are strands in moral philosophy that regard values as purely subjective and non-argumentative. The value-ethical core of a value-reflexive governance therefore does not only take stock of the values involved but also develops both philosophical mechanisms to deal with value conflicts and participatory mechanisms to deal with value conflicts in social contexts.

By and large, we expect ethics to play a dual role in solving value conflicts. On the one hand, ethics contributes to the understanding of what is actually meant by a given value as there are very often different and conflicting interpretations of the same value. Ethics might as well check different value interpretations with regard to their moral rightness or goodness. On the other hand, ethics helps to handle conflict between different values. As mentioned earlier, water is an issue where many different values are at stake and where value conflict seems likely. An ethics of values offers philosophical frames to deal with conflicting values. Value-reflexive governance finally addresses the need to set up norms and regulations. This is especially required with regard to sustainable development, when value conflicts have to be settled within specific normative prerequisites (cf. Ott and Döring, 2008).

Toward a value-reflexive governance: more than good governance

When suggesting a 'value-reflexive governance', one has to clarify the relationship to 'good governance' as on the surface, both concepts might appear identical. The idea of good governance first evolved within the (value) context of the World Bank which wanted to develop principles that could determine the allocation of loans to developing countries and that had a strong anti-corruption bias. The genesis of good governance conceptions in the context of an international economic institution does not delegitimise the concept as such. However, it has to be carefully assessed if good governance concepts encourage hidden forms of paternalism when introduced top-down (Czada, 2010).

Building on UNESCAP, Pahl-Wostl and Toonen define good water governance as 'participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive and [... following] the rule of law' (Pahl-Wostl and Toonen, 2009a, UNESCAP, 2012). What follows from this definition is that norms such as transparency, accountability or participation are central

cornerstones for a more legitimate and just ('good') governance. While the concept of good governance is mainly concerned with norms that are meant to guide governance processes, it remains unclear and merely implicit which values are at play – if not largely insensitive for values hold by governance participants.

This observation leads to two main further questions to be addressed in the processes of water governance: (1) Which values form the basis of normative statements about how 'good water governance' should be; (2) Whose values are meant to guide governance? Thus, we introduce the concept of 'value-reflexive governance', which (a) makes explicit underlying values of good governance norms, whose values formed their basis and the processes by which they became guiding imperatives and (b) offers solutions that open, transparent and more inclusive governance not only allows more social actors to express their values but also ensures that those values can be translated into policy programs. In contrast to the broad concept of good governance, the concept of value-reflexive governance stresses the point of sensitivity in regard to participants' values in governance processes. Ensuring that the values of all stakeholders might be voiced and heard within governance process does not say anything about how to deal with values, let alone value conflicts. It even might appear that value-reflexive governance leads to more value dissent as more stakeholders are involved.

Consequently, this results in a dual focus with regard to water. What are the values that guide governance of water and water sciences? Water science is a highly self-regulating social system. However, politics and business play an important role in shaping it. Both spheres interact. A value-reflexive governance of water opens up dialogue on underlying values. At the same time, water sciences take part in solving social problems and are therefore actors in governance processes. While traditionally the sciences have been assigned with the role of contributing a standing knowledge to deal with concrete problems, this (self-) perception changed. Fixed all-cure solutions failed in concrete social contexts because governance processes overlooked value dimensions of people affected by political and technical solutions. In value-reflexive governance, water sciences and practitioners do not contribute to societal requests by providing fixed knowledge but by developing specific solutions to problems with a specific time-space dimension. This requires an understanding of values involved and suggestions how to deal with value conflicts. In water governance, value conflict arises over the questions whether water is to be seen as a product of engineering systems, a trading good or a non-substitutable natural capital or whether it is a property right, a human right or a common good. With regard to agriculture, the question of using freshwater for growing non-food products will have to reflected in the light of multiple other value dimensions involved such as food ethics (e.g. meat consumption), global justice (e.g. virtual water) or sustainability (e.g. bioenergy) (Ingram, 2011; Ott and Döring, 2008). Against this backdrop, value-reflexive governance needs, among others, conceptual clarification as well as extensive deliberation on the ethical norms and decisions to be made in water governance.

Conclusion

The paper started from two observations: first, fresh water, agriculture and food production and climate change are closely interlinked and second, water governance is much needed to deal with the effects of climate change. So far, the record of water regulation is mixed, which can among others be traced back to the neglect of the political dimension of water. Finding solutions to water problems is not only about technology to be applied by experts, it is also a highly normative business with high values at stake. The paper suggested the concept of value-reflexive governance as a response to the present shortcomings in water governance. The proposed approach intends to make values visible and accessible for rational discourse and at the same time suggests value discourses as a low-threshold entry for stakeholders to ethical debates of water governance. It does not (yet) provide detailed suggestions for policy implementation nor for philosophical tools that guide value discourses and that themselves fit to

diverse social and institutional contexts. Both have still to be developed. What is hoped for is improved water governance and sciences alike by generating political procedures and solutions and scientific knowledge that are more credible, trusted and legitimate, based on deliberation on the underlying value dimensions.

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Mapping core values and ethical principles for livelihoods in Asia

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Abstract

In this paper the authors present the concepts of and describe the method used in field work connected to the development of an 'Ethical Aquaculture Food Index' (EAFI), as part of the EC-funded project, Sustaining Ethical Aquaculture Trade (SEAT). This project looks at the trade of aquaculture products from Asia to Europe, with a focus on four Asian countries; Bangladesh, Vietnam, Thailand and China. It is motivated by fair trade and a perceived disconnect between the expectations of European consumers, with regard to product quality, traceability and sustainability for instance, and the values and interests of Asian producers. The EAFI will represent a framework of measures that indicate whether trade is fulfilling the values of producers and consumers alike, according to ethical principles of relevance in Asia and Europe. We thus sought to map the stakeholder realities in Asia, as the landscape of key values and ethical principles. Interviews were initiated from late 2010 into spring 2011, to reveal stakeholders' core values and ethical principles linked to livelihood, society and the environment for instance. Three techniques were used as practical research tools for this field work. One was the use of pictures and verbal descriptions for ranking of possible value options. This was done due to the level of illiteracy among the informants, but also due to the general complexity and intricacy of such value questions. Another technique was the use of scenarios to ease the understanding and description of current and future value realities related to aquaculture. The third technique was the use of stories to reveal the informants' stand regarding some ethical principles including precaution, polluter pays, fairness, equality, care for next generation and animal rights, without using academic or bookish terms.

Keywords: sustainable, fair trade, index, aquaculture, field work

Background of the study

This paper is a follow up of our former EurSafe paper (Haugen *et al*., 2010) describing the development of an Ethical Aquaculture Food Index (EAFI) for international food trade. This is part of the project 'SEAT – Sustaining ethical aquaculture trade', financed by the European Commission (SEAT, 2009). The EAFI will represent a framework of measures that indicate whether trade is fulfilling the values of producers and consumers alike, according to values and ethical principles of relevance in Asia and Europe. The project looks at the trade of aquaculture products from Asia to Europe, with a focus on four Asian countries; Bangladesh, Vietnam, Thailand and China. It is motivated by fair trade and a perceived disconnect between the expectations of European consumers, and the values and social realities within Asian producer countries.

As mentioned in the introduction of our former Eursafe paper (Haugen *et al*., 2010) Aquatic food products are becoming a major part of people's diet worldwide. In 2006, almost half of the world's food fish came from aquaculture. The FAO study *The State of World Fisheries and Aquaculture 2008* (FAO, 2009) forecasts that by 2020 aquaculture will contribute with 60% of food fish.

At the same time European consumers are increasingly demanding food safety, food quality, ecological food, environmental concerns and social responsibility. Retailers and supermarkets are attentive to these concerns, as are NGOs. 'Positive political consumerism' (Micheletti, 2006: 24), i.e. through taking voluntary measures is a growing phenomenon. Eco-, organic- and fair trade labels are examples

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of this. For the aquaculture industry this translates to a wide range of concerns that can be summarized under the label of 'good ethics'. Aspects of this could include socio-economic conditions of production, ecological footprint and long-term sustainability (Kaiser, 2006), nutritional value, animal welfare and equitable trade.

The rapid growth of Asia-Europe aquaculture trade places a particular challenge on Asian producers who mostly operate under very dissimilar conditions from their European counterparts. Existing labelling schemes have typically imposed narrow and localized interests, and have often been unrealistic for Asian producers.

In this paper we present the conceptual framework of and describe the method used in field work connected to the development of an EAFI. The fieldwork maps the stakeholder realities in Asia as a landscape of key values. This was done for getting a knowledge base to support efforts in finding out how the strong European demands in food standards can be balanced against the Asian stakeholder realities and future prosperity desires.

Theoretical perspectives

Core parts of the concept and idea behind the method used in the field work are the notion of an ethical 'landscape' and the values that pertain to it. We therefore find it worthwhile to elaborate our understandings of some core issues related to the concept of values. Here we drew on another EU-funded project 'Value isobars – The landscape and Isobars of European Values in relation to Science and new Technology' (www.value-isobars.eu).

Ethical 'landscape'

With regard to the ethical 'landscape' we are thinking in the terms of 'landscapes' of values as developed by Meisch and Potthast (2011: 4) in the 'Value isobars' project. They refer to a 'landscape' of values in connection with overviews of value concepts, of parameters and their interdependence as well as identification of main fields of value-conflicts and of shared values with regard to science and technology.

The concept of a value landscape is derived from the idea of a moral landscape developed by Charles Taylor (1985). He uses, according to Rosa (1996), a spatial metaphor to illustrate how people relate to their values and how they built up a moral space which consists of a net of corresponding situational perceptions, courses of action, emotions and self-conceptions. In this way, people locate themselves and orientate themselves within what can be described as a moral map (*ibid.*). This location then takes the shape of a narrative reconstruction of their life and alludes to the image of a road of life. Such a moral map gives information about the self-conception, biography and future aims and desires of an individual (Meisch and Potthast, 2011: 6). According to Mandry (2009), a moral map is continuously evolving and developing.

Using the above perspective, we have developed our approach of gathering value information which shall in the end provide the backbone for an EAFI. In particular we built on the assumption that we gain a reasonable good mapping of a value landscape if we have empirical information on expressed actor values, on ethical principles endorsed by the actors, and on evaluations of specific future scenarios relevant to their own professional career and private prospects. We also assume that (1) in mapping we do not deal with single values but with clusters of interrelated values; and (2) values are part of a narrative. It is through the narrative that individuals or groups portray for themselves or for others where they come from, where they want to go and how their ideal world would look. Thus, we need narrative constructions, presented by us as scenarios, as part of our method in order to approach actors' values.

Values

For investigating the ethical 'landscape' it is significant to elaborate on what values are and how they might be defined. Historically, the concept of value, at least in English, French, German and related languages, has its origins in the economic sphere. It associates to prices as well as to expressing a more general esteem or quality judgment. We 'evaluate' and thus ascribe a 'value'. The use of the concept 'value' outside an economic context first became common around the end of the 19th century (Joas, 2000).

Generally speaking we could consider values as ideas about what constitutes a good life. Here we reach in some sense back to classical Greek philosophy, with the difference that the classical philosophers envisaged a single end-point, whereas we today are more prone to accept a multitude of end-points, thus essentially replacing an objective conception ('the Good') with a subjective one ('my values'). Although the focus on what makes a good life might give the impression that values are only about achieving positive ends, Gaskell *et al.* (2010: 7) state that one might want to include values about what we want to avoid. Those values would then make up the negative side of our evaluation scale, without assuming that they are merely mirror-images of our positive values. The project Value-isobars ends with the following suggestion for the definition of values, which we found useful for the understanding of values in our field work: 'Values are reference points for evaluating something as positive or negative. Values are rationally and emotionally binding and they give long-term orientation and motivation for action.'.

Value conflicts or value dilemmas indicate also that some values might contradict each other and are unlikely to go together, while others form frequent combinations. This opens up a value conception which allows for different weightings, in other words, values should not be treated as absolutes but as elements within a web of values where weights are re-negotiated in new situations. One feature of this is that in late modernity people are able to mix and switch between value systems rather than being guided by universal canons.

Given these general characteristics of values, a number of further features evolve that are important for the proper understanding of values. We shall not repeat detailed justifications, but just briefly refer to some differentiations as they emerged in the Value-isobars project.

Values are typically underlying or bringing about attitudes and specific preferences, but not all attitudes or preferences are coherent with actors' values. In social science, attitudes and preferences based on value-rankings are often used to explain and / or predict actor behaviour (rational choice theory). Normativists (e.g. Talcott Parsons) would, however, distinguish between norms, desires and values, and order them hierarchically, but it is unclear how this explains concrete actions. Similarly, 'motivationalists' in ethical theory (e.g. Richard Hare), face the difficulty that their basic assumption, namely that values explain and predict action, is incoherent with empirical observation. In sum, values are usually implicated when explaining actor attitudes or actions, but it is not clear how strongly they actually explain. Indeed, values do not prescribe actions, norms do that, with this one of the most striking distinctions between these two concepts.

In reflection then, the advantage of mapping values is that it is useful to think about what contents do play a role in thinking about the good life. The problem however by addressing positive values only is that, by definition, values are things that are considered good, which implies the so-called 'values as truism' problem (Maio and Olson, 1998). Pragmatically it is important to distinguish what values are considered more relevant than others.

Research method

We now turn to the method for giving effect to this conceptual framework. One core consideration when developing the research method was the need to formulate a method for accessing values and indicators that was accessible to the diversity of stakeholders engaged, including some who were illiterate, while having some transparent foundation in theory and sound social science. Another consideration was a balance between quantitative and qualitative approaches. On one hand, quantitative studies present a widespread account of stakeholders' realities, but do not permit exploration of much depth. On the other hand, qualitative interviews allow for a richer picture, but are susceptible to being labelled anecdotal. A third consideration was the need to 'cross-validate' stakeholders expressed values and indicators; by including a number of methods, this allowed for the validation of information from varying angles.

With regard for these considerations, this research developed two different methods: a value-ranking exercise and research into practical measures of value fulfilment.

Value-ranking

Mapping the ethical landscape began in each Asian country with a quantitative survey of the values important to aquaculture farmers, as one central group of stakeholders within the aquaculture industry. Face-to-face interviews with 400 aquaculture farm owners or managers in each country were done. The questions of relevance to this paper were ranking two pre-prepared sets of values in terms of their importance. One set was about their own concept of the 'good life', while the other was about their concept of a 'good society' (see Table 1 below). This ranking saw respondents presented with two sets of pictorial cards, each representing a value, and asked to place the cards in a column, with the most important value at the top down to the least important at the bottom.

The two sets of values were formulated in partnership with the Asian research partners across the four countries and were consistent across all four countries to enable comparison. Within each country a translation was made of the English word for the value into the local language, and then by way of a quality check, was re-translated back into English by an independent translator. Beyond translation, Asian research partners were asked to find a pictorial representation of each value that was relevant within their own country.

Some strengths to the value ranking included:
- allowing for its application in the at-times challenging conditions in the field;

Table 1. Values ranked by aquaculture farmers in Asia (in no particular order).

Values important to individuals' lives	Values important for the community
Personal prosperity, happiness and wellbeing	Health, safety and income security
Family and household	Equal personal opportunities
Friends and relatives	Individual freedom; e.g. to speech, vote, religion
Local community	Respect between humans
Country	Collaboration and cooperation in the community
Animals and Nature	Social harmony
Future generations of community and country	Environmental concerns
Religion and God	Strong political leadership

- pragmatic for use in a survey engaging a large number of stakeholders;
- engaging for interviewees and often the catalyst for an enthusiastic discussion.

Some weaknesses to the value ranking:
- there was not the opportunity for respondents to add new values;
- did not allow for any meaningful analysis of the reasons that underlie their ranking;
- risk that the voting method saw values 'cancel each other out' so that none were preferred.

Identifying indicators of value-fulfilment through scenario exercises

The next challenge was to give more detailed substance to this landscape map by way of concrete expressions of these values, or indicators, both to unpack how stakeholders interpret these values and what underlies them, and as way-markers toward the fulfilment of key values. The challenge was how to draw out these indicators from stakeholders, with indicators of value fulfilment a relatively abstract concept that defies direct questioning on this subject. It was conceived that one interesting means for illuminating indicators was through engaging stakeholders in an open discussion on future scenarios for the industry; allowing them to make comparisons between different scenarios and describe in concrete measures, why some scenarios are preferable to others.

Unlike the survey, the qualitative scenario exercise was undertaken through open interviews with a diversity of stakeholders from throughout the industry value chain, and indeed from the wider community in which the industry is nested. Owing to time constraints, just 10-14 interviews were undertaken in each Asian country, including primary stakeholders within the aquaculture value-chain, from feed-suppliers to farmers or processors, and secondary stakeholders within the wider community like teachers and shop-keepers.

For this exercise four future scenarios for the industry were conceived in the four quadrants formed by crossing two scales: (1) the regulation of the industry, from heavily to lightly regulated; and (2) the intensification of aquaculture farms, from intensive to extensive. After being presented with the four scenarios, respondents were asked about their desirability and why this was so, through four questions:
1. Which scenario best describes the current situation?
2. Which is the dream scenario for you?
3. Which scenario do you expect will be the real situation in 5-10 years?
4. Which scenario will be most beneficial to the next generation?

Some strengths to the scenario exercise included:
- successful in identifying broad types of indicators that were important to stakeholders;
- indicators serves to show what underpins the values of the ethical landscape;
- indicators were both used in a positive and negative sense regarding future progress.

Some weaknesses to the scenario exercise included:
- more complicated than the value ranking, and at times confused respondents;
- the scenario framework may have served to control the kinds of indicators expressed;
- not any explicit measures taken to link indicators to values therefore the researchers will need to subjectively allocate the measures to values.

Conclusions

This paper described how the authors sought to map Asian aquaculture producers' social realities, according to a map of values in an ethical landscape. It used a pluralistic method that (1) satisfied

philosophical demands; (2) met non-academic common usages of complex ideas; and (3) investigated area-specific values. In this way, this paper described two methods; one that mapped prominent value peaks through a survey, and one that provided substance underlying those values through indicators.

This work will form the backbone on the EAFI. It is anticipated that this mapping exercise will demonstrate the most prominent value peaks in the ethical landscape, and the kinds of way-markers that demonstrate fulfilment of these values, such that these can become the starting point for a more detailed and scientific project of arriving at indicators

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Section 16. Biotechnology in context

Conflict cloud green genetic engineering: structuring and visualizing the controversy over biotechnology in agriculture

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Abstract

The use of biotechnology in agriculture is still under debate especially in Germany. The dispute shows multilayered levels including topics like climate change, consumer sovereignty, biodiversity or farmers' dependency on the agricultural industry. Faced with such an escalating discussion, it is difficult to gain an overview of the significant controversial issues. The paper gives a summary of a qualitative content analysis of thirty information brochures criticizing the use of genetic engineering in agriculture in order to reconstruct the conflict. Since it was a main ambition of the study to present the results in a way the general public is able to understand and attracted by, the paper suggests a simple method for visualising the results of such analyses in form of a so called *conflict cloud*. By this means an online-presentation was developed in order to make the different aspects of the conflict understandable for non-experts. The study is part of the cooperative research project *ForPlanta* (www.forplanta.com). Funded by the Bavarian Ministry for Science, Research and Art, *ForPlanta* investigates the adaptability of plants to multiple stressors like drought, heat and pathogen as they are caused in particular by new climate conditions. The long-term aim is to improve, based on new findings and biotechnological methods, crop yield in the field.

Keywords: green gene technology, teaching ethics, data visualization

Introduction

An efficient and sustainable agriculture is an important goal of present policy and research, particularly in the context of climate change. However, the question, to what extend genetic engineering will play a determinant role in the strategy to tackle global challenges of agriculture, is still a controversial issue in many countries. The dispute over biotechnology in agriculture is an on-going debate including a broad range of topics like coexistence, world hunger, climate change, consumer sovereignty, biodiversity, allergens, dignity of creation, farmers' dependency on the agricultural industry, population growth, lobbyism, etc. (cf. for example: Müller-Röber *et al*., 2009: 384ff.; Ott, 2003; Peters, 2008: 147). Over time, it has become more and more difficult to gain an overview of the significant arguments and the important controversial issues. Especially non-experts find it difficult to understand what the dispute is about. Since it is one main target of applied ethics to make clear(er) what controversies are about and since modern science is required to communicate its results to the public in an understandable way, the objective of this paper is to analyse the conflict and suggest a simple method for structuring and visualising the complexity of ongoing debates in the field of applied ethics.

Methodology

The ethical module of *ForPlanta* started with a qualitative content analysis (cf. Mayring, 2003) of thirty information brochures criticizing the use of genetic engineering in agriculture in order to reconstruct the conflict. It was suggested that the conflict is not only about benefits and risks of the technology, but also about social impacts or general questions in regard to the relationship between man and nature. 334 critical arguments were identified, classified into categories and attributed with keywords. Concerning the categories, the study followed Michiel Korthals' analysis of the debate about biotechnology in

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agriculture: According to Korthals, the points of criticism revolve around three issues: (1) metaphysical and religious objections; (2) possible risks for human health and environment; and (3) questions of social effects (cf. Korthals, 2003: 357).

To give an example of the steps of the procedure: The information brochure 'Gentechnik – Manipuliertes Leben' (Genetic Engineering – manipulated living), published by Umweltinstitut München e.V. in the year 2010, raises following objection: 'Bt crops are a significant risk to the environment. The poison affects not only parasites, but also beneficial insects. Studies have shown that there are negative effects on different species of butterflies, earthworms and many other insects.' (Umweltinstitut München e.V., 2010: 15) The argument was classified into the category 'Risks (for man and environment)' and tagged with the keyword 'Non-target organisms'.

In general, and as for any content analysis, it is important to understand the chosen approach as one possible way of reconstructing the controversy. The arguments in critical information brochures must not be confused with the widespread tendency of the European public to reject GMOs. In fact, the focus on the organized protest means a specific perspective on the debate. However, after decades of intense discussion current brochures and position papers can be seen as collections of relevant arguments. Regardless of their validity, these arguments 'stood the test' as they have proven to be influential arguments in the public debate.

Results and discussion

Following Korthals (2003), the identified critical arguments can be classified into objections concerning (1) deontological deliberations (focusing on nature as part of the moral community); (2) risks (to man and environment); and (3) social effects (e.g. farmers' dependency on the agricultural industry or agribusiness companies' exertion of influence on political decisions). The content analysis is able to show that the controversy about biotechnology in agriculture is not confined to a calculation of risks and benefits, rather the debate is characterised by a number of additional controversial issues and questions relevant to public and society, which are implicitly or explicitly negotiated. Here, the study identified following topics:

- dealing with lack of knowledge;
- trust in those responsible;
- basic attitude to scientific and technological progress;
- regulation of the market;
- model of agriculture;
- relationship between man and nature.

Information brochures criticizing the use of genetic engineering in agriculture are tending to discuss biotechnology in the context of these issues, e.g. biotechnology in agriculture is described as the spearhead of 'turbo-capitalism' or as part of a dystopian vision of agriculture. A second look reveals the particular importance of deontological deliberations: While the opposing positions concerning risks and social aspects are driven by differing *descriptions* of the real effects of the technology, answers concerning the general relationship between man and nature start from different *normative* foundations. In other words: While there is a very broad consensus concerning the ethical principles and important values concerning questions of risks and social aspects (wellbeing, autonomy, justice, etc.), there exist greatly diverging arguments concerning the question how to deal with nature from a moral point of view.

Conflict cloud: structuring and visualizing the controversy

Since it was a main ambition of the study to present the results in a way the general public is able to understand and attracted by, the main outcome was transferred into an online-presentation – using the presentation software *Prezi* – visualising the results of the content analysis via a so called *conflict cloud*. Transferring the visualisation into an online-presentation (cf. http://www.ttn-institut.de/konflikt-gentechnik) and sharing the code – so that everyone is able to integrate the presentation into his website – have to be seen as a good strategy to reach a larger public beyond the academic community. The general approach follows the method of tag clouds as visual representations for text data which allow quickly perceiving the most relevant content by showing the importance of a tag with the font size. The *conflict cloud* is in this way an attempt to achieve two aims at the same time: To give an easy and intuitive overview of the wide range of arguments in a conflict, and to plot the complexity of such controversies making clear, that any visualisation and summary can only be the basis for an in-depth discussion. For this reason the *conflict cloud* seems to be an ideal tool for the beginning phase of a workshop.

Although the content analysis chose a qualitative approach in the first instance, there exist already first results of a quantitative evaluation of the 334 identified arguments and their attributed keywords. Figure 1 gives a general notion what the *conflict cloud* looks like – it should be noted that the graphic was developed for an online-presentation with zoom function; so the printed version can only give a general idea of the visualisation.

Since this kind of diagram emphasizes the complexity of the debate, the online-presentation in a second step unravels the disorder by focusing on the several categories. Figure 2 gives an example by showing the *conflict cloud* of the arguments in information brochures criticizing the use of genetic engineering in agriculture concerning deontological deliberations.

Figure 1. Conflict cloud green genetic engineering.

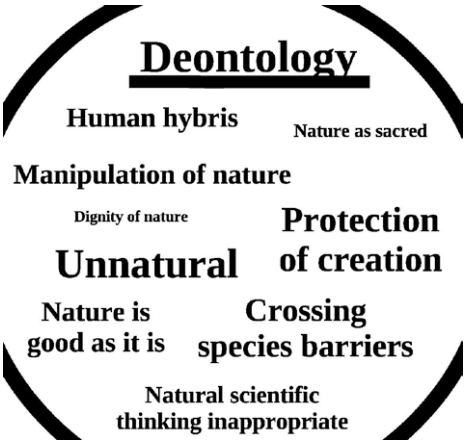

Figure 2. Conflict cloud green genetic engineering concerning deontological deliberations.

Conclusion

The content analysis proved that the controversy about biotechnology in agriculture is not confined to a calculation of risks and benefits, rather the debate is characterised by a number of additional controversial topics like dealing with lack of knowledge, trust in those responsible, regulation of the market or the general relationship between man and nature. The simple but intuitive way of visualising the wide range of arguments in the debate in form of a so called *conflict cloud* can be useful to plot the complexity and the main lines of the controversy. Transferring the visualisation into an online-presentation and sharing the code – so that everyone is able to integrate the presentation into his website – must be seen as a good strategy to reach a larger public beyond the academic community.

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Maize as a cultural element of identity and as a biological being: narratives of Mexican children on the transgenic maize debate and the importance of knowing the context

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Abstract

In a multicultural country such as Mexico contexts do matter, more if that context could be completely modify with the introduction of transgenic maize. During 2009 we developed a workshop that allowed us to dialogue and know the different narrations of Mexican children from twenty schools across the country, about their relationship with maize. The products obtained in the workshop (narrations, drawings and interviews) show differences between the representations of maize that children had. In general, in rural schools, maize is a sacred and cultural element of identity, while in city schools it is a living thing. In contrast, both agree that maize is a fundamental part of their lives and a basic component of their food. In 2010, we returned to the same schools to show the narrations of José (from a rural school), and Laura (from a private school in Mexico City) and explored their opinions on these narratives. The discussion of the children highlights that it is important to know how maize is considered in other contexts to redefine their original thinking and value traditional and scientific knowledge: '... at last, maize is both a cultural element of identity and a biological being, and I love it'. Finally, the discussion was focused on how the introduction of transgenic maize could affect the life of José and Laura and what do they need to do and know to decide whether they incorporate or not transgenic maize to their lives. The discussion was quite relevant since the Mexican government is intending public participation on the GMO's debate and specific proposals from indigenous communities and consumers. The workshop showed that participation requires a better scientific understanding of GMOs, but also the knowledge of indigenous people and recognized that the discussion must be locally relevant and culturally appropriate. Narratives set up a perfect scenario at schools to know the others reality and be part of a reflexive process, after all 'why does José have to use transgenic maize if it does not respond to his way of living and needs'.

Keywords: biodiversity, GMO, multiculturalism, values, decision-making

Mexico a multicultural country where contexts really matter

Mexico is the primary center of origin and domestication of maize with 59 current races of maize (Sanchez *et al*., 2000) that reflect the diversity of the 61 Mexican indigenous groups with different needs, values and interests in a specific trait. They value these different traits because most indigenous farmers consume what they produce (Bellon, 1996). Their choices and decisions are determined by factors like agronomic performance and of course the quality of the food products. In Mexico, traditional agriculture have allowed farmers to plant a heterogeneous landscape in which numerous maize populations coexist even in the same community. The trade of seeds and information is a very common social practice among indigenous families and communities as well as the saving of seeds from one season to the next one (Bellon and Berthaud, 2006). Maize landraces are attached to specific and local traditions, the main value is not economic at all but landraces have an outstanding socio-cultural importance. The indigenous knowledge about the environment has allowed traditional farmers to preserve their culture and natural resources using a set of practices that cause minimal land degradation ensuring the diversity of races of maize over time and the diversification of cultural ways of living. In Mexico maize is consumed

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everyday and it represents half of the total volume of food that is consumed every year providing 50% of the needed calories in a diet (Gálvez *et al*., 2008). Maize is not only the staple food of Mexican, it also has different meanings and uses, its cultural, nutritional, historical, environmental, symbolic, religious, social, and economical significance which makes it quite difficult and complex to evaluate possible risks, benefits or even the management during the production and commercialization of GM maize. In a multicultural country such as Mexico contexts do matter, more if that context could be completely modified with the introduction of transgenic maize.

Children as experts, why not?

Even though experts have been taking important decisions on biosafety matters, they have not considered specific contexts or socio-cultural consequences. The possibility of using just scientific arguments and evidence to determine the effects of GM crops in this diversity of multicultural contexts is unreal because each environment and each particular context is differently and culturally determined. In order to consider different contexts and opinions during 2009 we developed a workshop that allowed us to dialogue and know the different narrations of Mexican children as experts from twenty schools across the country about their relationship with maize and their opinions on the introduction of transgenic maize in Mexico. We asked 1,700 children from freshman year in Mexico about the current sociocultural role of maize in their lives. They told us and draw their own experience and situational practices that allowed us to access their social relations and helped us to understand their social context (Bertaux, 2005).

The workshop was called '*Mi maíz*' (My maize) referring to the idea that each children has a very particular relation with the maize making the experience and expertise unique and very valuable. The workshop was divided in two parts during 2009 and 2010. The main goal of the first one was to know their personal relations with maize and their socio-cultural context. They draw their favorite food made with maize and described the social and cultural relations around that food (who prepared it, how do they prepared it, and the persons that eat that food with them). Then as experts they had to narrate what was maize for them, what meaning and role have the maize in their lives. All the narrations were documented by the students, videotaped, recorded and photographed. In 2010, we returned to the same schools to show the narrations of José (from a rural school), and Laura (from a private school in Mexico City) and to explore their opinions on these narratives. Finally the children worked in teams and discussed about the consequences that GM maize would have in their lives and in other children lives.

Sociocultural importance of maize: is not the same in rural and suburban areas and in cities

The products obtained in the 2009 workshop (narrations, drawings and interviews) show differences between the representations of maize that children had. In general, in rural schools, maize is a sacred and cultural element of identity. Children from rural areas have a sacred unified idea where man, work and nature are related within the milpa. They feel as part of the nature and during the harvest periods they celebrate with the family and the community the end of a cycle. Children know that they are the keepers of those seeds that their families have bred and kept during generation: 'I know that is my duty and a privilege to take care of my maize, because it is unique in this region and the tortillas made from this maize taste delicious'.

We also found evidence that show that the social and cultural practices in the community are important part of the knowledge that children have about maize because the formal education that they received at school is not related at all with their lives. The educational contents in the official books seem to be far away from their realities and sometimes useless.

Children that work in the milpa or in the maize crops had specific activities according to their ages. They also reaffirm their identity participating in the rituals, festivities and symbolic activities that the communities organize to celebrate the presence of maize in their lives. They also recognize the importance of the trade of seeds and the different landraces that have selected for decades within their families: 'My great-grandfather told me that the red corn that we have was a present from an uncle that lived in the coast, but now that maize is better adapted to our environment and resists the drought of this area'. In the rural context while working in the milpa, children learn about soils, water, climates and beneficial synergisms that allow them to optimize their crops, pest control, soil fertility and productivity in an ecological way. Inside the milpa they also learn about the importance of working together, family values, and group values while respecting the sacred component of nature. In contrast with urban and suburban schools, children from rural schools know how to prepare food with maize and the process of 'nixtamalization': 'I help my grandmother to prepare the nixtamal with the blue corn at night and then early in the morning we make the tortillas, especially on holidays, yummy delicious!!!'

In suburban schools they keep the traditions related with maize during the harvest and religious festivities where always food is the main component. However, they prefer to set aside from the field activities because they consider it as an activity that only poor people realize: 'I'm quite confused because my mother says that I do not need to know anything about the milpa where poor people work, I must study at school and learn from books to have a good work. But I really like to be in the milpa with my grandparents'. Children from suburban schools are in touch with the milpa and the maize fields or at least know someone that work on the fields. They also like to participate in the maize festivities during harvest time but they do not consider the maize as sacred. For them the maize is a very important plant that allows their families to have economical safety and food through the year: 'My grandmother and my mother prepare tamales and atole everyday and they sell them outside my school. They prepare the flour from the grains of my granddad's milpa'.

Finally, for children from city schools maize is a living thing, a biological being. The knowledge that they have about maize come from the books and their teachers: 'My teacher told me that the maize is a green plant that produce corn. We read in the book that it is green because it has chloroplast. My mother buys the elote on the market and prepares a delicious soup'. Most children from city schools have never been in a milpa or know about the nixtamilization process. They usually buy the tortillas on the market or in the supermarket and some of them have tried blue, black or red tortillas when they travel to rural areas: 'Last holidays we went to a small town and we ate blue and pink tortillas, it was really great. I've never seen such a thing, the color and the flavor was amazing, why don't we have those tortillas here in the city?'

Despite the difference between rural, suburban and city schools, all the children agree that maize is a fundamental part of their lives and a basic component of their food. When we asked about their favorite food prepared with maize and the person who prepared it, in general they mention their grandmother (89%), their mother (10%) and finally only one mentioned that his grandfather prepared tamales with the maize. All the children were really happy to participate in the workshop and show their knowledge about the maize. They felt really important when we explained them that they were the experts and that we need their help to learn about the maize in the everyday lives of Mexican people.

In 2010, we returned to the same schools to show the narrations of José (from a rural school), and Laura (from a private school in Mexico City) and explored their opinions on these narratives. We presented to the children both narrations and discussed about their testimonies. José works in the milpa since he was five years old selecting the seeds to make the tortillas, the seeds to prepare the flour for tamales and the seeds that will be the grains for the next crops. He knows how to experiment with their seeds when his grandfather sees a new hybrid in the region. Sometimes José exchanges seeds with his neighbors or

family, a practice that it is well known by traditional farmers (Louette, 1997). José can also identify a hybrid corn from a creolized variety.

> I help my granddaddy in the milpa, I learn more in the milpa than in the school, I enjoy to be there in the field and learn. Early in the morning I go to the milpa and then I return in the afternoon after school. During harvest time it is very difficult for me to go to the school because we have a lot of things to do in the field. All my family is working there and we love to eat fresh elotes from the milpa. Then we have to prepare the festivities to thanks for the crop; in this celebration the entire town participates and is great to have food, music, my family and my friends.

José knows that he needs to take care of the milpa everyday because is also a member of the family that need to be loved. He wants to study biology or agronomy to improve his harvest and to support his grandfather who is getting older.

> My name is Laura and I live in Mexico City. My favorite food made with maize is the pozole and the maid of my house, Juanita, prepares it. My mother does not know how to cook, but she can make some quesadillas. My grandmother also prepared great enchiladas, but in general Juanita cooks.

In contrast, the narration of Laura shows a very different context where food is not prepared by a member of her family. Laura thinks that very poor people works in the milpa because they don't have money to go outside their towns. 'When we go to the supermarket my mother buys tortillas that a man made with a machine. We don't eat a lot of tortillas because my mother told us that you can get weight if you eat a lot of tortillas. I explained my mom that in biology class we learn that the maize is a very healthy food but she prefers to be slim than healthy'. She also knows that maize is a green plant that grows from a seed, gives fruits and then dies: 'it's a biological being that have been domesticated for the human being'.

In general, children from suburban and city schools recognize the importance of knowing the meaning of maize as a sacred being because they think they can respect it as an important component of the lives of rural children. While in rural communities children also recognize that is really important to know the biological characteristics of maize in order to understand the specific characteristics of the genetically modified maize and defend their interests. Then they can assess whether or not they want the GM maize. They discover that in their schools they can learn something useful for their lives: 'maybe I can explain my granddad the biological things around the maize and he will now understand the difference between transgenic maize and our maize. We know that the difference is not only in the interior of the plant, because always there is an economic interest there, but now we can have more useful information'.

The discussion of the children highlights that it is important to know how maize is considered in other contexts to redefine their original thinking and value traditional and scientific knowledge: '... at last, maize is both a cultural element of identity and a biological being, and I love it'. Finally, the discussion was focused on how the introduction of transgenic maize could affect the life of José and Laura and what do they need to do and know to decide whether they incorporate or not transgenic maize to their lives.

Conclusions

The discussion in both workshops was quite relevant since the Mexican government is intending public participation on the GMO's debate and specific proposals from indigenous communities and consumers. The workshops showed that participation requires a better scientific understanding of GMOs, but also the knowledge of indigenous people and recognized that the discussion must be locally relevant and culturally appropriate. Children narratives set up a perfect scenario at schools to know the others

reality and be part of a reflexive process, after all 'why does José have to use transgenic maize if it does not respond to his way of living and needs'.

It is also clear that the scholar programs does not offer answers for the needs of the communities and some children mention that 'the things that you learn in school are for the school and the things that you learn outside of the school are really useful because they help you in your life'.

The official contents of secondary schools show a defined knowledge that is not connected with the everyday life of the children (Paradaise, 2002). But if teachers see the milpa as a source of information that can be used to learn the official contents and can be useful for children and their families. In that way they finally can establish a link between the classroom and their lives and start to build up new and useful knowledge where traditional and scientific knowledge really solve their problems.

The genetically modified debate cannot be presented outside of a context because it will not have any sense or cultural relevance for the children. Or in the worst cases people tend to imagine unrealistic consequences of maize transgene flow because they do not have the information about a specific context (McAfee, 2003). When you contextualize the situations and the possible benefits or consequences you can take better decisions because your life is involved in it: 'even if Laura and José have different lives they must be aware on how the introduction of transgenic maize would affect them and the positive and negative consequences that their decisions must have for them and for the others'.

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Implementation of ethical standards in a cattle improvement company

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Abstract

Cattle breeding demands a wide range of skills and competencies. Traditionally, companies have addressed breeding as a technical challenge. However, it equally raises a variety of fundamental, moral questions. This is further complicated as cattle breeding is currently a global activity. Consequently, local ethics are confronted with global issues and vice versa. CRV, as one of the main players in cattle improvement, recognised this and started a process of implementing ethical reflection into its organisation. This implementation is part of a process that is a direct result of two developments. Firstly, the rapid international expansion of CRV resulted in a growing need for clarity concerning CRV's ethical standards and moral values, as all parts of the organisation operate under the CRV-brand, but with ethical standards that differ locally. Secondly, as CRV's main focus is animal breeding and due to its involvement in research into and the application of biotechnology, internal and external stakeholders desire clarity and transparency concerning the company's ethical standards. To clarify its own values, CRV started a process of defining ethical standards and values. As one of the first steps CRV joined EFFAB (European Forum of Farms Animal Breeders), which resulted -together with scientists, the industry, animal welfare organisations, ethicists and economists – in the CODE-EFABAR. Secondly, CRV established an Ethics Committee as an advisory board to CRV's Executive Board. This Committee advises on ethical issues pertaining to CRV's activities and assists in shaping CRV's social responsibility. Thirdly, using input from the Ethics Committee, CODE-EFABAR, managers and employees, a new ethical conduct code was developed. This code of ethics was implemented by issuing an 'ethics passport' to each employee in a number of sessions which presented and discussed the organisation's core values. The 'ethics passport' not only presents CRV's corporate ethical standards and values, but explicitly attempts to translate these values into the daily activities of its employees. This translation and emphasis on daily activities aims to make individuals aware of their role in the company's ethical behaviour. This short paper elaborates on the company's process of dealing with the ethical dimensions of cattle breeding in a global market and presents some of the challenges and dilemmas CRV faced while explicating and implementing its core values and principles.

Keywords: code of ethics, ethics committee, guidelines, challenges

Introduction

Cattle breeding demands a wide range of skills and competencies. Traditionally, companies have addressed breeding as a technical challenge. However, it equally raises a variety of fundamental, moral questions. (cf. Gamborg and Sandøe, 2005; Olsson *et al*., 2006; Sandøe *et al*., 1999). This is further complicated as cattle breeding is currently a global activity. Consequently, local ethics are confronted with global issues and vice versa. CRV recognised this and started a process of implementing ethical reflection into its organisation. CRV is an international enterprise active in the field of cattle improvement. It offers farmers a diverse package of breeding and management products and services, including semen from various dairy, beef and dual purpose breeds, artificial insemination and online management programs. CRV is owned by Dutch and Flemish co-operative stakeholders and has expanded internationally over the last twenty years. It now has business units (BU) with offices and barns on ten different locations

worldwide, situated in Western Europe, Central Europe, North America, South America and Oceania. CRV also exports to fifty other countries on all continents. The rapid international expansion of CRV was the primary reason for the growing need for clarity concerning CRV's ethical standards and moral values, as all parts of the organisation operate under the CRV-brand, but with ethical standards that differ locally. Secondly, as CRV's main focus is animal breeding and due to its involvement in research into and the application of biotechnology, internal and external stakeholders desire clarity and transparency concerning CRV's ethical standards. To define its own values, CRV started a process that led to the recent implementation of an 'ethics passport' for all its employees. The following sections describe and analyse the four steps of the process.

Four steps towards transparency and clarity on corporate values

To achieve transparency and clarity regarding CRV´s moral values and standards, four steps were taken:

1. Joining networks, building infrastructure and defining core values and standards
   To define CRV's ethical standards and values, CRV joined EFFAB (European Forum of Farm Animal Breeders). Together with scientists and the industry, animal welfare organisations, ethicists and economists, the CODE-EFABAR was developed. This sets out the goals of animal breeding organisations, the way in which goals are pursued and the rules that govern the activities of breeders. Secondly, an Ethics Committee was established to advise CRV's Executive Board. The Committee consists of three farmers who are members of the cooperative, two CRV employees, an animal ethicist and a member of the public. It advises on ethical issues pertaining to CRV's activities and assists in shaping the social responsibility of the organisation.

2. Defining code of ethical conduct
   Using input from the Ethics Committee, CODE-EFABAR, managers and a number of employees, CRV defined its core values and standards. As the CRV members are Dutch and Flemish, this definition was based on the prevailing standards and values in the Netherlands and Flanders. After the values and standards were defined, a code of ethical conduct was developed.

3. Internal implementation: improving awareness
   To ensure employees observe the ethical code, the most vital step after defining the code was implementing it within the organisation. Great emphasis was placed on translating the rather general core values and standards into the practice of daily activities of employees. Concerning animal health and welfare, for example, CRV's code of ethical conduct states:

   > CRV treats animals with respect and carefully ensures the good health and welfare of its animals. CRV takes careful measures in its service provision, the distribution of material and the transport of animals to minimise the risk of disease transmission. In this context, CRV uses modern bio-security methods and quality assurance systems, amongst others (http://www.crv4all.com/docs/pdf/Ethische-code.pdf).

   For the individual level this general principle is translates to: 'I treat the animals entrusted to my care with respect. I work carefully to prevent disease transmission. I perform actions involving animals in a responsible manner.' The objective is to make employees continuously aware of their professional role in the ethical behaviour of the company. To stress this aspect of professional responsibility, the introduction and implementation were done during special sessions in which employees were presented with their 'ethics passport'. They were introduced to the ethics code by a PowerPoint presentation given by the local management to emphasis ethics as a line responsibility and a brief video speech by the CEO. Moreover, the 'ethics passport' was presented in a box accompanied by a pen inscribed 'let your conscience be your guide'. This was added in order to help people to take good

notice and to be aware of the code, every time they use the pen. Finally, the Managing Directors of each BU signed a contract stating that they have taken note of the code, will ensure that staff under their responsibility also take note of the code, and that they will take all reasonable precautions to ensure that subordinates act in line with this code.

4. External implementation
   To create transparency, CRV also implemented its code of ethical conduct externally. With respect to these external partners, a more passive policy is followed. Based on the code, a brochure on ethics was drawn up and published online. If asked about the ethical standards and values, employees can produce this brochure. These tools are not distributed actively.

The code as a living document: start of a new policy, but with some challenges

Although CRV succeeded in defining its core values and in translating these into a practical code of ethical conduct there are still a number of challenges and dilemmas. A first challenge is related to the diversity of local ethical standards. As an international company CRV is confronted with this plurality, while an ethical code of conduct requires a more univocal starting point. This problem is addressed by applying the ethical standards and values that are commonly shared in the Netherlands and Flanders situation. The reason for dealing with the problem of the moral plurality in this way is twofold. On the one hand, the cooperative shareholders of CRV are based in the Netherlands and Flanders. On the other hand, especially with respect to ethical questions of animal use these countries have a strong tradition. This requires constant care and reflection for the next years.

Related to this first issue, a second challenge raised. The problem to ensure that everyone could reasonably agree on the content of the code. This issue was resolved in two ways. First, there have been a process of thorough discussion during the process of drafting the code. Second, CRV deliberately chose to place the bar not too high in the code's first edition. In two years' time, the code will be reviewed to see if it can incorporate sharper goals and higher ambitions. In the next step of internal implementation it is vital to ensure it becomes part of the mind set of people, and to stimulate them to act accordingly.

Finally, the step of external implementation raises a challenge. Especially with respect to non-exclusive sales representatives it is difficult to get them committed to CRV's ethical conduct code. The current strategy is to explain them the CRV's motivation to implement the code in detail and grant them some time to adjust will encourage sales representatives to adopt the code as well.

Conclusion

The process of defining and implementing ethical standards and values made internal stakeholders more aware of their role in shaping the social responsibility of the company. It has increased openness and transparency to internal as well as external stakeholders. The challenges describe show that the code is a living document and that continuous reflection with internal and external partners is needed.

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Section 17. Animal ethics

Leaving the ivory tower or back into theory? Learning from paradigm cases in animal ethics

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Abstract

Ethical issues are per definition issues of public concern and interest. Media plays a vital role in presenting and shaping them. From the beginnings of modern animal ethics, paradigm cases – e.g. factory farming, laboratory animal science and fur farming – were used in the public debate and presented offensively. The moral wrong of these paradigm cases has a high plausibility in the wider public. Of course, nobody is against respectful treatment of animals. However, these paradigm cases do not raise the question of moral duties towards animals only. Further, they implicitly conflict with a wide range of values and provide the platform for the societal debate about values. Under this perspective, the character of the ongoing debate can be much better understood. Ethics can help to address moral issues in human-animal relations with explicit respect to conflicting (morally relevant) values. To focus solely on the moral status of animals in animal ethics loses sight of the related societal problem at stake. This position runs the risk of putting forward a perspective under which ethical issues in human-animal relations appear to be problems of the real world where moral outlaws mistreat animals for unworthy reasons. If our duties towards animals were the only duties we had, this view would be justified. However, this is not the case and a number of other values are at stake. Animal protection is an important value but other values like human welfare, gaining knowledge, etc. are equally important. Therefore, the moral issues of animal ethics should not be framed irrespectively of conflicting values and under the perspective of 'the right treatment of animals' only. In a wider sense animal ethics should use the frame of 'normative orientation of societies' in general. This shifts the role of animal ethics within society. I will argue in favor of a 'healthy social distance' or in other words 'academic freedom' that provides the basis for trustworthy mediation of societal conflicts without losing sight of practical demands. There is no stepping back into the ivory tower. However, looking at these issues from a distance can serve as a powerful source of philosophical insights that can be used in future practice-oriented animal ethics.

Keywords: animal ethics, human-animal relation, paradigm case, societal reflection

Introduction: leaving the ivory tower

Since its beginnings in the 1970s modern animal ethics has been involved in political, juridical and scientific questions concerned with human animal relations. This doesn't come as a surprise since ethics deals with societal issues and provides the normative basis for a just orientation of societies. However, in the last decades animal ethicists have been increasingly involved in political matters and have been invited to support social developments. They are asked to give feasible answers to practical questions, e.g. regarding farmed animals (keeping animals for food), lab animals (using animals in scientific procedures), zoo animals (keeping wild animals), etc. Such moral issues are often triggered by scandals presented offensively in the media. These media events suggest that there is something severely morally wrong in our dealing with animals, and ethicists are called for. Prominent animal ethicists – for instance Peter Singer and Tom Regan – even see their involvement in exactly these societal disputes as a part of their scientific responsibility (Grimm, 2012). As a consequence they explicitly support the animal liberation movement. Against this background it does not come as a surprise that 20 years ago some authors described animal ethicists as 'midwives of the animal liberation movement' (Jaspar and Nelkin,

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1991: 90-102). In the following, I will elaborate the argument that the involvement in the political debate whilst aiming to support the animal liberation movement can be problematic. A closer look at the paradigm cases of animal ethics reveals that the role of animal ethics in the social debate should be critically reflected. Therefore, ethicists are well advised to think about their role and competency within societal developments not only with regard to human-animal relations.

The argument will be outlined that the step out of the philosophers' ivory tower into the public debate has had severe methodological implications for animal ethics. The focus on societal issues has not only shaped the research interests but also the methodology used. Learning from the last decades of ethical dispute regarding human-animal relation, I will raise the question how ethicists can deal with the particular challenges of animal ethics within practical contexts today. I will argue in favor of a 'healthy social distance' or in other words 'academic freedom' that provides the basis for trustworthy ethical argumentation without losing sight of practical demands. There is no way back into the ivory tower. However, theoretical knowledge can serve as a powerful source or 'resting place' for animal ethicists where they can reflect their aims and reframe their insights to be used in practice-oriented animal ethics.

The formation of paradigm cases of animal ethics and the media

The beginning of animal ethics in its present sense (in the following *modern animal ethics*) can be pinpointed with the publication of 'Animals, Men, and Morals: An Enquiry into the Maltreatment of Non-Humans' (Godlovitch *et al*., 1972). Interestingly, this book already identified the fields of interest that are still influential. Paradigm cases of ethical discussions were identified: most prominently factory farming, animal use in lab science, fur production, hunting and trapping. Also the following powerful publications and corner posts of animal ethics – 'Animal Liberation' by Peter Singer (Singer, 1975) and 'The Case for Animal Rights' by Tom Regan (Regan, 2004 [1983]) – deal with those issues as the most pressing and problematic ones. Not only but also due to the fact that factory farming, lab science, fur production and hunting were in the focus of the pioneers of animal ethics, these topics and related arguments still direct the debate. Further, we find a clear devotion of ethicists to change those practices actively. E.g. looking at Regan's article on 'The Case of Animal Rights' his aim is to tell the reader that his position (abolitionist view) aims at the total abolition of the use of animals in science; the total dissolution of commercial animal agriculture; the total elimination of commercial and sport hunting and trapping (Regan, 1985: 13). Singer addresses the core problems similarly and states them in his prominent book 'Practical Ethics' (2011 [1979]). Despite the fact that many other topics could be addressed – such as pets, fishery, and animals in sports – the mentioned topics became what I am going to call the *paradigm cases for ethical reflection* in animal ethics. But what are the features of these highly influential cases? Why could they gain such a high interest in public debate? Of course, the public interest is often triggered by scandals or outcries presented in the media, but what are the characteristics that fueled the interest? In other words: what traits make the topics mentioned paradigm cases of public interest, and consequently issues of ethical concern?

Only in part the reason can be seen in the number of animals used. For example, in most European countries many more animals are kept as pets than on fur farms. In the following, it will be argued that the ethical dimensions concerned with animals are only one aspect of paradigm cases in animal ethics. However, it is the most important one that drives the debate. As a starting point, I will use a quote from Jasper and Nelkin who inquired into the 'The Animal Rights Crusade: The Growth of a Moral Protest': 'Renewed concerns about animals have generated a powerful social movement driven by a simple moral position: animals are similar enough to humans to deserve serious moral consideration.' (Jasper and Nelkin, 1991: 3). The message is *simple* and it has to be – one could add – in order to be successful. From this starting point, features can be outlined that make the paradigm cases, like fur farming, factory farming and laboratory animal science, eminent moral wrongs in public perception.

Moral intuition: undoubtedly ethically wrong

As Jasper and Nelkin put it, the very basis of the social movement lies in the similarity of humans and animals. Against this background, animals became an issue of moral concern. This position is well documented in the literature and provides the corner post of modern animal ethics. Animals and humans share morally relevant traits that make them beings with moral standing (cf. Singer, 1997 [1976]: 21; Regan, 2004 [1983]: 42f.). It is not exaggerated to believe that this position has turned into a 'moral common sense' since the 1970s (cf. Engels, 2001: 71). Especially with respect to fur farming, factory farming and laboratory animal science this common sense is celebrated and perpetuated in campaigns:

> Right now, millions of mice, rats, rabbits, primates, cats, dogs, and other animals are locked inside cold, barren cages in laboratories across the country. They languish in pain, ache with loneliness, and long to roam free and use their minds. Instead, all they can do is sit and wait in fear of the next terrifying and painful procedure that will be performed on them... (http://www.peta.org/issues/animals-used-for-experimentation/default.aspx).

Practices, such as laboratory animal science, are presented in a manner that there can be no doubt: Certainly, it's ethically wrong. A very good example that illustrates the point is the video 'Testing... One, Two, Three' from PETA (http://www.peta.org/issues/animals-used-for-experimentation/default.aspx). It seems clear to the viewer that we are confronted with ethical wrongs.

Irreconcilable views: inside and outside perspective

Looking at campaigns like the one mentioned above, professionals feel misrepresented. The perspective of animal protection campaigns naturally conflicts with the professional perspective. Firstly, those who work in the mentioned fields claim to act on a legal basis, and secondly they claim that they do what they can in order to assure the welfare of the animals that they keep. This professional attitude conflicts with the outside perception for the following reasons. First, the professional perception within the field is typically bottom up and induced by practical concerns, whereas the outside perception can be described as top down: it is not about adjusting existing practices, but what is done to the animals on farms, in laboratories and so forth is bluntly wrong and such practices should be prohibited. These opposing views result in a gap between the inside and outside view. Inside view (practitioners): the activists' perception is just too simple minded and they do not know enough. Outside view (activists): the moral actors in these fields do not live up to ethical standards. These opposing views often conflict in the public debate and hamper mutual understanding and dialogue.

Addressee of criticism: being not one of them

Campaigns in the field of animal protectionism rarely try to engage people working in the criticized fields. Rather, such campaigns focus on non-professionals who are not directly involved in the criticized practices. This makes, of course, perfect sense: it is easier to motivate people for changing things if they do not carry the costs themself. A campaign against fur farming will not recruit their supporters within the fur farming community. Consequently, the addressees of the messages are in a clear social distance to the criticized animal keepers. This can be described as a social distinction among those who are on the right and those who are on the wrong side. Following Bourdieu (1982) such evaluations might have a strategic function to make social distinctions and perpetuate class divide (cf. Uekötter and Zelinger, 2012).

Perceived nearness: the psychology behind

A forth trait of paradigm cases is the animals' *visible* similarity or nearness with humans. They share e.g. physiological, psychological, behavioral and social characteristics and needs. Some of them look similar

to humans or are cute like babies, other animals develop strong social bonds comparable with those among humans. The perceived nearness is an important reason that e.g. the chimps (socio-cognitive abilities), some whales (socio-cognitive abilities), cats and dogs (social role as family members) have a strong lobby; the olm (*proteus anguinus*) has not. The *nearness* seems to carry a lot of psychological power in human-animal relations and in the public debate. However, not every trait that brings animals closer to humans is morally relevant. To distinguish between the moral standing of a mouse and a dog or the mentioned olm is not very plausible. This is again for the reason of similarity, but in a *biological* sense (at least in a pathocentric framework). Despite their biological similarity, the replacement (not in the sense of the 3R) of all mice in scientific experiments with dogs would presumably result in a much louder debate. And maybe the outcries would be less if olms were used. This unequal treatment of (more or less) equals can't be justified within an ethical framework that takes the individual animal and its needs into account. The 'social hierarchy' – starting with the dog and ending at fish – cannot be justified in most ethical frameworks but can be psychologically explained.

Reduced complexity: simplicity

Within the debate, the issues' complexity is often reduced to moral concerns about the animal. Hence, problems stemming from practical constraints are often missing in the debate. Therefore, animal keepers and critics often find themselves in a clash of interests and do not often come into mutual exchange. One reason for this is the fact that the ethical debate in the mentioned fields is often solely centered on the question 'What is ethically wrong?' The factual and normative constraints of actors are not in focus. Consequently, economic interests, practical conditions and opposing scientific opinions tend to be neglected in the debate. When societal issues are dealt with in the public arena, the message has to be simple. These debates are not designed to bring about mutual understanding but to sell news. There is nothing wrong with polarized messages. However, more detailed questions, e.g. about animal welfare in laboratory animal science, factory farming, fur farming, etc. and how to improve it do not make their way through the mass media. Media reduces complexity and has to do so. Accordingly, detailed discussions or the demonstration of the issues' complexity are rare events in the public media.

The mentioned issues provide a platform where specific human-animal relations are discussed in order to draw conclusions for the wider field of human-animal relations. For instance, fur farmers see themselves as farmers using minks to produce high quality clothing, whereas critics describe them as harming animals for highly questionable, i.e. luxurious, goods. The value of such goals is questioned which has an effect on comparable cases. If e.g. fur farming is banned with reference to moral values, this serves as a basis for similar cases. If producing luxurious goods with animals is publicly seen as unjustified, all practices that use animals in order to produce comparable goods with comparable costs on the animal side are put into doubt. This is why the mentioned fields can serve as paradigm cases.

Animal ethics as a platform for societal reflection

Is it only the moral issues in human-animal relations, or is there something else implicitly fuelling the societal debate? I think that there is much more at stake when we discuss the paradigm cases of animal ethics. For instance, the debate about factory farming does not only stress the shortcomings in our human-animal relation. Since agriculture is the place where nature is supposed to be found, the debate about factory farming provides a platform for a general critique of the relation of man and nature. It deals not only with economic interest that leads to a reduction of animals to mere production units. For instance, issues like our economic attitude and the attitude of treating nature as a pure resource in general are at stake. Further, issues like as to whether technology should take place in agriculture or become 'more natural' or a hide-away for 'the natural' enter the discourse. So the basic critique is that there is something severely wrong in our relation to nature and natural beings in general. Technology

is one part of the problem. Otherwise it would not be understandable that improvements on farms in favor of animals are perceived as problematic if they are high tech or science driven. Therefore he debate about factory farming is also a debate about technology and nature.

Similar arguments apply to the field of laboratory animal science. The debate cannot be understood in a narrow sense that focusses on the animals in scientific procedures only. The debate also stands for the social reflection about the value of knowledge and science in societies. In a nutshell, the moral plausibility of scientific research is eroding not only because of the animals used but also because of an incline of the status of science in society. Besides other values and interests, the value of academic freedom conflicts with the moral status of animals (some countries already included animal protection in their constitutions so it can be in conflict with academic freedom in a legal sense). In other words, gaining knowledge is not perceived as an untouchable good but sometimes as problematic. To decide whether it is problematic or not occupies a great number of commission members, e.g. in Germany, Austria and Switzerland and of course other countries. Accordingly, the debate about laboratory animal science provides a platform for societal reflections about the value of knowledge and academic freedom and not just the question of whether certain experiments can be justified or not.

Similar things are true for fur farming. The debate addresses the unneeded, luxurious goods and inconsiderate use of animals for negligible human interests. However, below the surface the discussion can be understood as a critique of a perpetuated class divide (cf. Uekötter and Zelinger, 2012). It is not only about the treatment and housing conditions of animals but about making social distinctions and matters of injustice in societies.

The mentioned traits of the paradigm cases in animal ethics support the following argument: In their dealing with ethical issues, animal ethicists do only in part work on ethical problems related to animals. Many other fields are entered that can't be dealt with under a narrow perspective on animals and their moral standing only. The term 'ethical issues in animals' is used for much more than what can be solved within animal ethics in a narrow sense. Societal values like economic prosperity, knowledge, just distribution of wealth are at stake. Therefore, the question of animal ethics in an applied sense is not 'How to bring about better conditions for animals?' but 'How to deal with societal value conflicts?' Animal ethics in a wider sense is therefore the reflection of value conflicts and how societal changes shall be directed. In other words, which (traditional) values have to give way to new values like respect towards animals? Which values do we want to knock down and which can withstand the new moral developments and can serve as normative guidance in future societies? In short: In which society shall we and our children live?

From this perspective, the intensity of the debate can be much better understood. The debate about societies' development finds room in the debate about paradigm cases in animal ethics. Accordingly, the question is not only how to treat animals right, but what is the society we want to live in and which values are worth sticking to. Therefore, animal ethics in a narrow sense is only one part of that debate and often only a door-opener to make a much stronger point. Behind the scene we enter questions of social justice, the value of knowledge, questions of the right attitude towards nature, etc. Looking on the paradigm cases from this angle, one can much better understand why they have fueled the debate for over 40 years, and this for good reasons.

The role of ethicists in the debate

If this argument is right, would not the concept of animal ethics and consequently the role of animal ethicists change? I think yes. Animal ethics could play an important part in mediating, framing and structuring the value debate. In order to be perceived as neutral mediators, animal ethicists have to keep

a clear distance to value positions within the debate. Their scientific methodology can help to contribute and improve the value conflicts in societies. However, this methodology and ethical theories can only be applied and used in the debate if ethicists are neither seen as animal protectionists, nor as a lobby group for commercial animal keepers. In order to demonstrate a clear scientific agenda, distance from the public interest is unavoidable. I believe that academic freedom is a great support and can contribute immensely. An independent and solid reflection about value conflicts in the public debate could contribute a lot to societal orientation. But ethicists can only be perceived as experts if they put forward ethical positions and leave the political decisions to the elected representatives. The can provide guidance, but they should not make decisions for others.

Conclusions

Obviously, this leads to another understanding of the role of animal ethicists. They do not only reflect moral dimensions of human-animal relations, but have to consider their value with respect to other societal values. In the debate about the paradigm cases we often find a tendency to focus on the moral value of animals only whilst forgetting that other moral values are at stake as well. Maybe animal ethics should inquire more into the justification of conflicting values than into the value of animal protection in order to be able to describe value conflicts in more depth. This could contribute to their mediating role in societal debates. This role, however, demands knowledge and an analytic distance from the values at stake (Grimm, 2012). Perhaps it is time to step back into the ivory tower and redesign general theories and methodologies to be prepared for a broader debate of animal ethics in practice.

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From just using animals to a justification of animal use: the intrinsic value of animals as a confusing start

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Abstract

Recently the Council for Animal Affairs issued a report, entitled the 'Agenda for Future Animal Policy'. One of the topics in this report is the emphasis on the need for the government to come to a more explicit and transparent justification for animal use. It is claimed that arguments that refer to tradition or existing practices of animal use are, or at least will be no longer a sufficient justification for the use of animals for a number of goals including, company, sports, science, and food. This need was recognized by the government and resulted in a project of the Ministry of Economic Affairs, Agriculture, and Innovation on the ethical justification of keeping animal (2011). One of the elements of this project was a series of focus group discussions with stakeholders on the moral values that underlie their practices of keeping animals. A second part of this project is an analysis of the problem of moral justification of keeping animal. This paper is the result of and presents some parts of this project. I start with a discussion of the question of why justification is needed. At this point the answer can both start from respect for public opinions and from specific views on the moral status of animals. In the latter case there are regular references to the intrinsic value of the animal. A notion that is even included in the law. The problem is that this concept is not used in a clear and univocal way. This is problematic, because a reference to intrinsic value may include different points of view on the moral position of animals and the acceptability of keeping animals. In this short paper, I try to distinguish three different views on the moral value of animals and the related view on the justification on animal use. And I propose to reserve only one interpretation to the reference of intrinsic value, i.e. the view that animals, based on some (higher) cognitive capacities, are worth of due respect as individuals and thus should be considered as end in themselves and not merely as means to human goals. This does not disqualify the other views. On the contrary, by using a more strict definition of the intrinsic value view, I think it is possible to understand and value the other moral position better.

Keywords: animal use, animal ethics, policy

Keeping animals as start for debate

Current policy in Europe allows people to keep animals. As in many other countries, in the Netherlands, this results in the keeping of many millions of pet and farm animals. However, the current public debate is no longer about facts and figures only. Keeping animals raises a wide range of questions, e.g. with respect to housing, food and veterinary care, but also with respect of the risks of all those animals for animal health and the environment. Even within these debates there is a clear plurality. Discussions on good housing include the question whether factory farms entail the housing of too many animals to guarantee good health and welfare, but also the question whether the welfare of a solitary housed rabbit can be guaranteed.

This has resulted in a renewed debate on keeping and using animals in the media, in politics and science. In these discussions one fundamental question is more and more often raised explicitly: what is the justification for keeping animals (cf. RDA, 2010). The fact that animals are kept by humans and the fact that there is policy that regulates this practice is no longer considered a sufficient normative argument

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in the justification of the keeping of animals. However, if this question is explicitly raised, the plurality of answers becomes immediately clear. For some keeping animals is unacceptable, while others do not see any problem. This plurality of views is not unique to the context of animal keeping. Nonetheless, there are at least two arguments that substantiate the need for a public debate on the justification of animal keeping.

The first argument is linked to the human-animal relationship. As Kluveld (2009) emphasizes, a human is just an animal from a biological perspective, but at the same time not every animal is a human. This tension between being different and having many things in common implies that decisions we make with respect to animals have also implications on how we deal with each other as humans. A second argument has its origin in the need to draft policy. Keeping animals is – at least because of the above-mentioned high numbers of animals – no longer possible without government intervention. This entails the formulation of minimal standards and a legal framework that guide individuals and organizations in their keeping animals. Such a framework is necessary in order to deal with the different, often even conflicting interests in and views on keeping animals. Such a policy, however, never can be value neutral. There often is a clear tension. On the one hand policy requires making explicit choices and requires a point of view in the debate on the justification of keeping animals. On the other hand, a liberal democracy should do justice to the plurality of views that are present in society. This results in the question of how a government ought to deal with conflicting of even mutually excluding views on keeping animals. A policy that is shared by all might not be feasible, however, in order to pay due respect to the legitimate views in society a public debate on keeping animals is essential.

Clarity on intrinsic value and a continuum of moral views on animals

The need to justify practices of animal use partly starts in the respect for the views of individual citizens. If citizens or political parties recognize the need to discuss the moral justification of keeping animals this is a relevant and legitimate reason to put this on the public agenda. Furthermore, the moral position of the animal itself can be an important reason to start up the process of discussing the justification of animal keeping. For those who acknowledge that the value of an animal is more than its usefulness from a human perspective, a reference to this instrumental value can no longer be a sufficient argument for justifying keeping and using animals.

In Dutch legislation this moral position of the animal is referred to in terms of the intrinsic value of the animal (cf. CRM, 1981; Wet Dieren, 2011). This often-used term, however, is not fully clear in its scope and normative power. Some relate this intrinsic value to the capacity to experience pain and pleasure and link it to a utilitarian normative framework. Others take higher cognitive capacities as a basis for the intrinsic value and combine it with a deontological line of reasoning. Finally, there are those how refer to the intrinsic value in order to stress to the unacceptability of keeping animals in general. The discussion on the justification of the keeping of animals shows the need to explicate the notion of intrinsic value. I propose to restrict the use of the concept of intrinsic value to the view that, based on some (higher) cognitive capacities, animals are worth of due respect as individuals. As an acknowledgement of this value each action should show respect to the individual animal. This is in contrast to (1) the view that animals matter as sentient beings; and (2) the view that animals do have inherent worth and dignity just similar to humans. The latter one implies that animals are not only worth of respect, but entails that their interests should be protected by rights. The first view entails that interests of animals always should be taken seriously in our moral reasoning, but that the individual do not have a protected status, because the aim is maximizing overall utility rather than the welfare of the individual.

My claim to restrict to interpretation of intrinsic value does in no way disqualify the other moral views. To the contrary, by using a more strict view on the intrinsic value view, I think it is possible to understand and value the other moral position better if we discuss the possibilities to justify the keeping of animals.

What needs to be justified and is it possible justify?

The importance to differentiate the intrinsic value view from a sentience approach and from the inherent worth approach becomes evident if one raises the question of what needs to be justified if one keeps animals. An answer on the question of what need to be justified can never be neutral. One ′s view on the moral value of the animal has a direct influence on one ′s ideas on what duties we have towards animals and thus on what requires a moral justification if one keeps animals. For instance, for those who start in the acknowledgement of the inherent worth view of the animal, a restriction of freedom always requires a justification. As a restriction of human freedom is only acceptable if it is the result of informed consent, any form of restricted animal freedom – that is inherently linked to keeping animals – is highly problematic. If one starts in respect for the intrinsic value of an animal, a restriction of freedom requires only a justification if the restriction is not out of respect for the individual animal.

For the practical possibilities of justifying the keeping and using of animals the importance to make a strict distinction between the different views that all refer to intrinsic value becomes even more clear:

1. The Inherent worth view formulates justification in terms of rights and – apart from emergency or life threatening situations – the keeping of animals as mere resources cannot be justified. It results in a 'no' or 'no, unless' answer to the question whether we are allowed to keep animals.
2. Those who start at value of an animal as sentient being refer to welfare in the process of justification. Keeping animals can be justified if (1) no welfare problems are involved; or if (2) an animal welfare restriction is legitimate from the perspective of striving for the maximization of overall welfare. In practice this results in a 'yes, if 'answer to the question whether we are allowed to keep animals.
3. In the intrinsic value approach justification is a matter of assessing and weighing values. Keeping animals can only be justified if (1) it shows due respect for the intrinsic value of the individual animal, i.e. that the animal is considered as an end in itself rather than mere means to human goals; furthermore, (2) keeping animals can be justified based on a value assessment in which the intrinsic value of the animal and the value of the aim that underlie the keeping are weighed. In the process of weighing there is not a single guiding principle: it is a matter of dealing with moral dilemmas. This will result in a 'no, unless' answer if the intrinsic value of the animal cannot fully be respected in a specific practice of animal keeping. However, if the keeping of animals clearly starts from the respect for the individual animal, this position tends to a 'yes, if' answer to the question whether we are allowed to keep animals.

This distinction is not only of theoretical importance, but helps to structure and understand the different points of view in the public debate on the justification of animal keeping and animal use.

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Daniel Haybron's theory of welfare and its implications for animal welfare assessment

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Abstract

Two accounts of welfare that are currently used in animal welfare assessments are firstly the Brambell committee's account that focuses on the absence of negative feelings and the capacity to display normal behaviour, and secondly an alternative account that focuses on the animal's capacity to display its normal behaviour and thereby to adapt to changing living conditions up to a level that it experiences as positive. Both accounts seem to be concerned with both, the animal's state of mind and its capacity to behave according to its nature. In order to better understand – and maybe even improve – these accounts of welfare, it is helpful to ask two questions: Firstly, which states of mind are important with regard to welfare? Secondly, how does the importance of those states of mind relate to the importance of behaviour in accordance with the animal's nature? Daniel Haybron's theory of welfare provides new and original answers to both questions. Haybron's affective state view conceives of happiness as a 'mental state', but unlike hedonism its focus is on emotions and moods, rather than merely on (un)pleasant experiences. The affective state view is concerned with a being's overall emotional state and includes a being's propensity for experiencing various emotions and moods. According to Haybron self-fulfillment is central to welfare, and an animal's emotional state is part of its self-fulfillment. Haybron's aswers might be useful for understanding and even improving the accounts that are currently used in assessments of animal welfare. In order to find out whether this is indeed the case, Haybron's theory of welfare and its implications for animal welfare assessment should be further explored and evaluated.

Keywords: Brambell committee, hedonism, nature fulfillment, affective state view

Two prominent accounts for welfare assessment

While there has been a growing public concern for animal welfare during the last decades, it is still debated what animal welfare consists in. The famous account of welfare by the Brambell committee, which was one of the first attempts of a scientific account of welfare, formulated the idea that animal welfare is preserved if the animals are kept free from hunger, thirst or inadequate food, thermal and physical discomfort, injuries or diseases, fear and chronic stress, and are free to display normal, species-specific behavioural patterns (Brambell, 1965).

This account is known as the account of the five freedoms. The first four freedoms denote allegedly negative experiences that are supposed to diminish the animal's welfare.

Critics have questioned whether those supposedly negative states always have a negative impact on an animal's welfare. Consider the human case: being hungry for a while might make the delicious meal that awaits you even more enjoyable; a certain amount of well-dosed fear is something that many people seem to enjoy and actually seek; and not every instance of temporary discomfort seems to get us down. Critics point out that wild animals are frequently confronted with challenges and have evolved to adapt and deal with those challenges. Provided that animals are able to deal successfully with those challenges, their welfare, according to the critics, is not diminished. Therefore, critics suggest that ' [...] perhaps the first four freedoms might be better re-cast, not so much as the rather negative 'freedom from' but [...] [as] a

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more positive 'freedom to react to...'' Alternative accounts of welfare therefore center on the notions of 'coping', and focus on an individual's ability to sucessfully deal with challenges (Broom, 2010) or on an individual's ability to adapt and to change (Korte *et al*., 2007).

Critics of the Brambell committee's account suggest that allegedly negative states are actually part of the normal repertoire of an animal. Efforts to minimize those states would therefore interfere with the animal's freedom to display normal, species-specific behavioural patterns. As the capacity to display normal behaviour is the fifth requirement of the Brambell committee's account of welfare, this has been identified as an inconsistency (Ohl and Van der Staay, 2011). Furthermore, while the first four conditions of the Brambell committee's account of welfare focus on the avoidance of allegedly negative states, the role of positive emotions in an account of welfare has recently received more attention (Bracke and Hopster, 2006; Duncan, 1993, 1996).

In the light of those criticisms, Ohl and Van der Staay have proposed the following alternative account of welfare: An individual is in a state of good welfare when it has: '[...] the freedom *adequately to react to* hunger, thirst or incorrect food,thermal and physical discomfort, injuries or diseases,fear and chronic stress, and thus the freedom to display normal, species-specific behavioural patterns *and adapt to changing living conditions up to a level which it perceives as positive*' (Ohl and Van der Staay, 2011).

Which states of mind are important with regard to welfare?

The question what welfare consists in can be answered at different levels. Most relevantly for this paper, the question can be answered at (1) the value-theoretical level, which concerns the substantial question what welfare ultimately consists in; and (2) the more concrete level, which concerns the question which concrete things impact on an animal's welfare. The above-mentioned accounts enlinst several requirements for positive welfare. However, they are not explicit in what they assume welfare ultimately consists in. For instance, one of the most prominent value-theoretical accounts of welfare, hedonism, implies that welfare is a matter of the balance of enjoyment an suffering: enjoyment contributes positively and suffering contributes negatively to welfare.

The above-mentioned accounts might assume hedonism as an underlying value-theoretical account of welfare. After all, the Brambell committee's account is concerned with the absence of pain, fear and discomfort. This might be considered important, because those are typically instances of suffering. Likewise, the Brambell committee's account requires the positve freedom to display normal behaviour. This might be considered relevant with regard to welfare, because being able to display normal behaviour might be thought to contribute to enjoyment. The Ohl and Van der Staay account might also assume hedonism. After all, it requires freedom to adapt to changing living conditions *up to a level, which the animal perceives as positive*. Thus, it seems to be crucial for this account as well that the animal experiences its mental state as positive.

However, there are also remarkable differences between those accounts. Those differences concern the question which states of mind are considered important with regard to welfare. The Brambell committee's account seems to assume that instances of pain, fear, and discomfort always contribute negatively towards welfare. The Ohl and Van der Staay account instead assumes, as has been shown above, that those states should not necessarily be considered as contributing negatively towards welfare. An argument for this latter position that is compatible with hedonism might be that although pain, fear and discomfort are instances of suffering and therefore contribute negatively towards welfare, completely avoiding them would be even worse for the animal, because it would restrict its freedom to behave normally and thus its welfare. According to this line of reasoning, instances of fear and pain will be compensated by greater enjoyment if the animal is allowed to display its normal behaviour.

(Attitudinal hedonists might instead argue that the animal actually 'takes pleasure' in some instances of fear and discomfort, and that therefore they do not count negatively towards welfare.) A non-hedonistic argument in favour of the assumption that some instances of pain and suffering do not diminish welfare would state that some negative mental states do not diminish welfare, not even a bit.

According to the affective state theory, not all pleasant experiences contribute positively and not all negative experiences contribute negatively towards a being's welfare. According to the affective state theory, what matters is not simply the sum of positive or negative experiences. What matters is something deeper (Haybron, 2008). The affective state theory is concerned with a being's overall emotional state and includes a being's propensity for experiencing various emotions and moods (Haybron, 2008; Wren-Lewis, 2010).

The affective state theory might explain, in line with the Ohl and Van der Staay account of welfare, why certain instances of fear, stress, and discomfort do not diminish a being's welfare. The reason is that they do not get the being 'down'. They do not impact on the overall mood of the being. The being is not getting depressed or anxious. When, however an animal is not able to adapt to a situation, as seems to be the case in at least some forms of intensive animal husbandry, the animal is prone to experience *chronic* stress, pain, fear, or boredom. In those cases, there will be a negative impact on the animal's mood. The state of the animal will be one of depression or anxiety. According to the affective state theory, those states, rather than temporary instances of fear or stress, are the relevant states of mind with regard to welfare.

Thus, it might be the case that the Brambell committee's account and Ohl and Van der Staay account give different answers to the question which mental states are relevant for welfare. The affective state theory might clarify the Ohl and Van der Staay account by pointing out *why* certain allegedly negative states do not contribute negatively towards welfare. Making that explicit would improve that account by providing a theoretical basis. Furthermore it would help to improve the account by correcting possible errors. For instance, the Ohl and Van der Staay account states that 'an individual is in a state of welfare when it has the freedom adequately to react to chronic stress.' However, chronic, as opposed to temporary stress is very likely to impact on a being's emotions, mood and mood propensity, and therefore to have a negative impact on the being's welfare.

How does the importance of those states of mind relate to the importance of nature fulfillment?

For both, the Brambell and the Ohl and Van der Staay account, it is not clear what the relationship is between on the one hand the importance of the animal's mental state, and on the other hand the importance of the capacity to display species-specific behaviour. As for the Brambell account, it has already been noted that there can be a conflict between avoiding negative mental states and letting the animal show normal behaviour. After all, dealing with states like hunger, stress and fear belongs to the normal behaviour of the animal. Furthermore, one might wonder whether the freedom to display normal, species-specific behavioral patterns is considered valuable because it tends to evoke positive mental states, or rather whether it is considered part of animal welfare in itself. Concerning the Ohl and Van der Staay account, one might wonder what the central constituent of welfare is supposed to be: Is it the degree to which the animal can display normal behaviour and adopt to changing living conditions (coping), or is it the animal being in a certain state of mind? Both constituents are considered important, but it is unclear which one is considered more fundamental with regard to the question what welfare ultimately consists in.

The hedonistic account of welfare gives priority to the animal's state of mind. Other things, such as the capacity to display normal behaviour are important only as a means for contributing to positive states

of mind. Ohl and Van der Staay seem to suggest that displaying normal behavior is important in itself, rather than merely as a means for realizing positive states of mind. However, if 'nature fulfillment' is considered crucial for welfare, why and how does the animal's state of mind come in at all?

According to Haybron, welfare consists (at least partly) in nature fulfillment. More precisely, welfare, according to Haybron, is a matter of self-fulfillment (Haybron, 2008: 194). Facts about what makes us happy, i.e. facts about what impacts on our emotions, moods and mood-propensities are important to who we are. According to Haybron, when individuals are living in conflict with their natures, and thus in conflict with who they are, they are unhappy. States of mind, in particular the less shallow and more central ones, are important for welfare. They are important because they are constitutive for self-fulfillment.

Thus, Haybron's account of welfare might clarify the Ohl and Van der Staay account by pointing out *why* both nature fulfilment and the animal's state of mind are important for welfare, and *how* those aspects of welfare relate to each other. Furthermore, explicit adherence to Haybron's account of welfare, which puts the primacy on nature fulfilment, would lend support to Ohl and Van der Staay's criticism of the Brambell committee's focus on the absence of negative states, and their argument that those states are part of the animals nature. On the other hand, subscribing to Haybron's account of welfare would prevent Ohl and Van der Staay from putting too much focus on the importance of allegedly natural states: not everything that happens in nature or to wild animals is therefore unproblematic with regard to animal welfare. If the animal's emotions, moods and mood propensities are negatively affected by something that happens in nature, the animal's self-fulfilment and therefore its welfare is negatively affected too.

Conclusion and further questions

This paper identifies implications of Haybron's account of welfare for thinking about animal welfare. Haybron's theory of welfare might be able to clarify and maybe even improve the Ohl and Van der Staay account of welfare. It implies that not all unpleasant experiences of an animal diminish an animal's welfare. Certain instances of fear, stress, and pain, might not influence a being's emotional state on a deeper level. That might be different for chronic pain, stress, or boredom. In order to determine which states of mind impact on a being's welfare, several criteria have been proposed. For instance, a pleasurable experience must be 'central' rather than 'peripheral', or it must be connected to the being's values. (Haybron, 2008; Wren, 2010). It needs to be established whether and how those criteria can be applied to non-human animals. Haybron's theory of welfare implies that welfare is ultimately a matter of self-fulfilment. Positive emotions, moods and mood propensities are important as constituents of self-fulfilment. What exactly it means that positive emotions are *part* of self-fulfilment, rather than, for instance, *indicators* of it, ought to be clarified.

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Cognitive relatives yet moral strangers? Killing great apes and dolphins for food

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Abstract

More and more species are being recognized as our 'cognitive relatives', sharing complex socio-cognitive abilities with us. What has been neglected so far, however, are the ethical implications arising from our growing knowledge on such dimensions of relatedness. Some philosophers claim that we should at least reconsider the moral status of those species which resemble us the most. They specifically refer to great apes and dolphins, while presupposing that the moral community is in principle open to other species as well. Accordingly, at least great apes and dolphins should be treated as non-human persons holding at least some basic personal rights (including the right to life or the right not to be tortured). Besides the question of extended rights, welfare and conservation issues arise from the way we still treat our cognitive relatives. We even kill great apes and dolphins for food, using highly destructive and unsustainable hunting methods. My presentation updates the case of animal rights by giving an overview on great ape and dolphin cognition as well as on the rights claims of Cavalieri and Singer (1994) and White (2007). Secondly, I will focus on the actual situation of great apes and dolphins in the wild. It will become obvious, that we are in fact far away from granting them minimum welfare standards – let alone basic rights. A whole network of extinction drivers is being identified. I will focus on the ones which are directly linked to food ethics: while dolphins and whales are being threatened by whaling or drive hunts and end up as bycatch, great apes are threatened by the bushmeat crisis. Thus, 'food issues' (among many other issues) play a vital role in the way we interact with our closest cognitive relatives.

Keywords: animal welfare, species conservation, bushmeat, drive hunts, whaling

Cognitive relatives

Within few months in 2007 ten of only about 680 remaining Mountain Gorillas were slaughtered in Virunga National Park, Democratic Republic of the Congo, in several separate killings. One of the females had been literally executed by a shot in her neck. Pictures of dolorous villagers, carrying the apes' carcasses for miles to bury them, were taken by Brent Stirton, who later received the World Press Award 2007 in the category 'Contemporary Issues' for his documentary work on the gorilla killings. Stirton, an experienced environmental and war journalist, had been 'taken aback by the scene'. He had been 'particularly struck' by 'how human the great animals seemed in death' and by 'the tenderness with which the rangers treated the bodies'. Never before, Stirton had seen a demonstration of compassion like that from the Congolese people (Klaidman, 2007). Thanks to these and similar disclosures, the world public finally got some shocking impression about the ongoing extinction of our next relatives. Increasingly, the complexity of the situation in many range states, involving habitat destruction, bushmeat commerce, armed conflict and many more threatening factors, is being realized.

Beyond the disciplines of biology and conservation, the scientific community also started to focus on our closest relatives and their survival. This comprises not only the great apes as our closest evolutionary relatives but also other species that seem particularly close when it comes to criteria of personhood (mainly social and cognitive abilities). In the following I will also focus on dolphins as 'cognitive relatives'.

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Especially within the last two or three decades, we have acquired a remarkable understanding of the cognitive relatedness between ourselves and some other species. We now know that great apes for example use tools and form cultures (Breuer *et al*., 2005; Van Schaik *et al*., 2003; Whiten *et al*., 1999). They are able to learn and communicate – even in human sign languages (see e.g. Savage-Rumbaugh *et al*., 1998). They probably even have a so-called theory of mind, which means they are aware of some of their own mental states and the mental states of others (Call and Tomasello, 2008; Tomasello *et al*., 2003). Like humans, they care for and mourn for each other (Cronin *et al*., 2011). They show signs of altruism (Warneken and Tomasello, 2006), but they are also capable of deception (Hare *et al*., 2006) or even intergroup aggression (Mitani *et al*., 2010). They laugh when tickled (Ross *et al*., 2009) and play – even in gender specific ways (Kahlenberg and Wrangham, 2010). They resemble human beings in these and many more regards. So do dolphins. Characteristics like cultural transmission of tool use, self-recognition, complex cooperation and language (including the capacity to understand and follow simple forms of grammar) have been found in these animals as well (see e.g. Benoit-Bird and Au, 2009; Herman, 2009; Krützen *et al*., 2005; Reiss and Marino, 2007).

Moral strangers?

With the awareness of relatedness comes awareness of responsibility. Ethical accounts like the Great Ape Project are therefore trying to strengthen dimensions of relatedness in moral theory. The project, which follows an animal rights account, argues that great apes and humans are genetically related and share a complex experience of emotions as well as cognitive abilities. Because these abilities are recognized as morally significant qualities, the project aims to extend the community of equals to include all great apes (humans, chimpanzees, bonobos, gorillas and orang-utans). This implies the same basic rights for all members: the right to life, the protection of individual liberty and the freedom from torture (Cavalieri and Singer, 1994).

Similarly, Thomas White argues for a 'new moral frontier' when it comes to dolphins. According to him, dolphins should be considered as non-human persons because of their advanced emotional, social and cognitive capacities (White, 2007). Because of their special abilities and vulnerabilities we face the same ethical obligations we face when interacting with human persons:

> Ethics – our labelling actions as 'right' or 'wrong' – is grounded in the idea that the type of consciousness that we have gives us special capacities and vulnerabilities. When we label something as 'wrong', then, we're saying that it crosses the line with regard to not respecting some fundamental feature that makes us human (White, 2007: 155).

According to the rights approaches mentioned above, we are asked to exclude great apes and dolphins from harmful practices in captivity as well as to stop their extinction in the wild. In what way are we in fact interacting with these animals? Most of us know great apes and dolphins from the zoo, from TV shows and entertainment parks. The captivity and exhibition of these animals is highly debatable from an ethical point of view and it has shaped rather grotesque forms of human-animal-encounter. Think about chimpanzees and orang-utans dressed up as ballerinas and kick-boxers or dolphins and killer whales jumping through hoops. It might be questionable how the visitor of such exhibitions perceives the animal. But at least, he doesn't see them as 'leather', 'steak' or 'bone meal' – does he? In fact, great apes and dolphins – like so many other species – are still being killed for eating. Despite an international moratorium on whaling, dolphins and whales are being hunted and processed to food. And despite national and international conservation law, (including CITES and CMS regulations) great apes end up as bushmeat. The issues of drive-fishery and bushmeat are of course not restricted to the two species we are talking about here. And in both cases we face a whole network of other conservation issues. I will try to sketch this in the following.

Killing great apes and dolphins for food

Dolphins and whales in general are threatened by increasing noise in the ocean (caused for example by boats and military communication systems like Low-Frequency Active Sonar), by water pollution, habitat loss and lack of food. Additionally, they end up as bycatch. Besides that, they were and still are hunted (IUCN, 2011).

In the Eastern Tropical Pacific (ETP), large yellowfin tuna (*Thunnus albacares*) swim together with several species of dolphins. This ecological association of tuna and dolphins is not clearly understood, but it has given rise to a highly efficient purse seine fishery. In the ETP tuna fishery dolphins are an intrinsic part of the fishing operation, as they lead the fishermen to the tuna. The two are then captured together. Unlike most other fisheries, the vast majority of dolphins captured by the ETP tuna fishery are released alive; thus, an individual dolphin may not be killed, but it might be chased, captured and released many times during its lifetime. Thomas White states: 'depending on the species of dolphin and location, estimates range from being chased 2 to 1 times each year and being caught 1 to 3 times. However, some groups are chased more than once during the same day, and some dolphins may be captured more than others' (White, 2007: 192). This results in extensive stress for the animals. Negative effects beyond (time-delayed) death include the separation of mothers and calves. In such a highly social species, it's reasonable to conclude that being hunted 'could affect everything from rates of reproduction to their social structure'. White writes: 'it's difficult to imagine how fishing for tuna 'on dolphin' can be defended as ethically acceptable' (White, 2007: 193). The number of dolphins killed since ETP purse-seine tuna fishery 'on dolphin' began in the late 1950s is estimated to be over 6 million animals, the highest known for any fishery (including the total number of whales of all species killed during commercial whaling in the 20th century, which was about 2 million). The bycatch of dolphins in the ETP tuna fishery has now been successfully reduced, but even at the present level of about 1.000 dolphins per year, it remains among the largest documented cetacean bycatch in the world (see NOAA, 2012).

Besides the bycatch issue and the problems associated with tuna fishery, extremely cruel drive hunts by Japanese fishermen were documented and made it into international news. Here, the dolphins are acoustically blinded, trapped in a cove and then stabbed or beaten to death. While the (highly polluted) meat of these dolphins is sold on the food market, some of these animals are sold to the dolphinarium industry, which makes the drive hunts profitable (see http://www.savejapandolphins.org/, Accessed 18 December 2011).

Besides these drive hunts, Japan still conducts supposedly scientific but highly questionable whaling programs. Besides many other points of criticism, the methods used here violate basic welfare demands. Whales which are harpooned and not killed immediately are almost certain to suffer pain. It can take many minutes, sometimes hours until they die after being wounded (Kestin, 2004).

Taken together, killing dolphins for food (as bycatch or non-bycatch) seems ethically problematic in many ways. Furthermore, welfare issues arise long before these animals' right to life is taken away (Reiss and Marino, 2007).

When it comes to great apes, the situation is little better. The endangered or even critically endangered great ape species seem to be well protected in national parks, but their numbers are dwindling and the last remaining habitats are shrinking. Deforestation and overexploitation directly contribute to the extinction of species through the destruction of habitat. Additionally, they trigger secondary threats, 'which are not directly connected to the original cause any more, but very dangerous if remaining unmanaged'. For instance, logging trails increase access to forest interiors, facilitating a now-rampant bushmeat or pet trade in Central Africa, Southeast Asia and the neotropics (Brook *et al*., 2008: 458).

Bushmeat is defined as the meat of wild animals. Bushmeat frontline countries in Africa are the DRC, the Congo Republic, Cameroon and Gabon (see Ammann, 2001: 71; Milner-Gulland *et al*., 2003; Wilkie, 2001: 86).

The hunting and consumption of bushmeat have increased dramatically over the past decades. Experts are therefore speaking of a 'Bushmeat Crisis' (Ammann, 2001: 72) which 'is destroying primate populations faster than their habitat can be cut down' (Rose, 2002: 208, 212). Bushmeat is hunted for several reasons. At least in rural areas, it often is the only available and openly accessible protein source. Still, for many consumers, eating bushmeat is not a necessity but a cultural preference or privilege for which they are willing to pay a price premium over domestic meat (Milner-Gulland *et al*., 2003: 251, 352; Wilkie, 2001: 86-93; Wilkie and Carpenter, 1999: 927). Most of the meat is smoked and transported over long distances. Prices can rise manyfold as it moves from hunting camps to big city markets or even to bushmeat restaurants in European cities. Estimated annual out-takes of more than 1 million tons of bushmeat from the Congo Basin add up to more than a billion dollar business (Rose, 2002: 210). Luckily, great apes are one of the most difficult and dangerous species to hunt. Within the forests of the Congo Basin their density is less than 0.13 per square km. Thus, their carcasses are relatively uncommon in markets. Primates constitute 20% of the animals sold in markets, apes less than 0.5% (Wilkie, 2001: 89). Still, they are severely threatened by the growing bushmeat trade. They as well are bycatch in traps and their hands, feet and sculls are sold as delicacies or fetish items (Ammann, 2001: 77; Wilkie, 2001: 87). Because they are so scarce, large-bodied, and slowly-reproducing animals, even current levels of hunting threaten their long-term survival (see Milner-Gulland *et al*., 2003: 354; Wilkie, 2001: 87; Wilkie and Carpenter, 1999: 927).

No ranger or conservationist wants to find a gorilla scull in a market fridge. And to animal rights activists and welfare scientists the situation of the great apes in the wild is a nightmare. Again, we face big challenges when considering our interaction with these animals from a welfare perspective, let alone a rights perspective.

Conclusions

As we have to replace the idea of us being the pride of creation (cognitive-wise), with the existence of 'cognitive relatives', we have to replace the pictures of happy Flipper or sweet gorilla baby hand-raised in our local zoo with the pictures of drive hunts and bushmeat commerce. What strikes me most as a scientist is not the brutality of these pictures. It is the gap between ethical claims growing stronger and stronger and the actual situation of these animals in captivity and in the wild. We seriously debate some basic human rights for these species and still even kill them for (non-subsistent) food. I consider this gap between ethical theory and status quo as the main characteristic of animal ethics in the 21st century.

Let me conclude with some remarks on the value of the mentioned ethical arguments. Animal rights claims which don't apply the idea of rights similar to basic human rights, have two problems: Firstly, they have to specify what they really mean by talking about rights. According to Gunter Nogge, 'if you asked them, gorillas would prefer to stay gorillas. They wouldn't want to have human rights but gorilla rights. Much would be gained already if we granted them gorilla rights' (Nogge, 1999: 449, transl. J. B.-S.). But what *is* a gorilla right? The content and meaning of such rights still has to be specified. Secondly: How much does a gorilla right or dog right weigh, compared to human interests or even human rights? What happens if the rights of animals collide with the rights of humans? Regan for example starts with a right to life for all animals who are subject of a life. But in the end he argues that the life of a human is richer than the life of a dog (whatever this means) and he uses this argument when it comes to the collision of rights (Regan, 2004: xvii f.). If we borrow from the idea of human rights instead, at least, we

don't have to specify what 'a right' is. We can rely on the expressive und demanding power of the notion of human rights and we know that we are in principle talking about inalienable and indivisible rights.

Yet, I think, the transfer of the notion of human rights to the sphere of human-animal interaction has not been debated adequately. Actually, Singer and Cavalieri have accomplished the transfer without theoretically debating it at all (at least not in the Great Ape Project book). White did include some theoretical thoughts in his book, but he hasn't deliberated the challenges and limits of this transfer either. So, for example, we still have to debate whether each human right is relevant for each species (depending on the species' capabilities and needs). Another problem might be that not all of the human rights are linked to cognitive capacities, or at least not to the same extend. The right not to be tortured for example might be mainly linked to suffering, and not to cognition.

But besides these open questions, applying the notion of human rights clearly puts an end to any utilitarian weighing procedure of interests. We prefer this in many cases where human persons are involved. To kill you, confine you in a cage, or torture you is not a question of any interests of mine (except perhaps in cases of pure self-defence). To me, the concept of human rights is indispensable when it comes to humans. Why shouldn't it be relevant at all when it comes to animals? Furthermore, if we are not aware of what we do to animals on an everyday basis, we won't value the claim for inalienable basic rights for them. That's why I went into detail with some examples.

But the language of rights constitutes only one possible, powerful (and to some: surely debatable) way of arguing for animal protection. I cannot think of any form of human-great ape or human-dolphin interaction that is *not* already problematic from an animal welfare point of view, be it swimming-with-dolphin programs, petting pools, dolphin-assisted therapy, drive hunts and whaling, the use of dolphins in entertainment parks or in the military. The same is true for keeping great apes in zoos, using them in animal experimentation or hunting them in the wild. Both, dolphins and great apes, face severe threats in regard to habitat destruction and thus to their immediate welfare and survival. Even from a welfare approach, we would have to stop most if not all of these forms of interactions and threats. As these species are highly endangered and play a vital role in the functioning of eco-systems, we can also argue from the perspective of species and wildlife conservation. Especially in the case of dolphins, another large predator will lack in the food chain. Like sharks for example, dolphins are desperately needed for a functioning ecosystem in the ocean. Perhaps we should combine all three arguments we got (rights, welfare and conservation arguments) to achieve a better protection of these animals. In the end, and not only in the case of great apes and dolphins, we face the power of facts: no matter how we theoretically argue for a better protection, the timeframe for doing so narrows from year to year and day to day.

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Assessing the animal ethics review process

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Abstract

Although animal experiments play an important role in biomedical research, their use is ethically challenging. Primarily in Europe, North America and Australasia ethics committees are set up to control the animal use in science. Project approval is usually decided on a case-by-case basis with focus on ensuring that the animals are caused a minimum of harm relative to the possibility of achieving beneficial results. Even though rules in this area are reasonably uniform there seems to be significant room for differences, individual and culturally based, between ethics committees concerning how the rules are applied. Our aim was to conduct a review of empirical studies of the different kinds of animal ethics committees in order to clarify what is known about their operation and highlight information which is missing in their evaluation. Our main findings are that there is a significant variation in process and outcomes of decision-making at individual and group levels which cause inconsistency between decisions. Different approaches have been suggested to improve the reliability of ethical review but no evidence to support any of them. More empirical studies are needed.

Keywords: animal experiments, ethics committees, harm-benefit evaluation

Introduction

In Europe, North America and Australasia entities such as ethical committees on animal experiments in Sweden, animal care committees in Canada, animal ethics committees in New-Zealand or Australia, institutional animal care and use committees in the United States, review animal research program proposals and finally approve or reject them. These entities which we in the rest of this paper will refer to as Animal Ethics Committees (AEC's) are given the task to protect the welfare of animals and to ensure that animals are used in a way that is scientifically worthwhile. The main role of AEC's is to consider whether a project is justified for the purpose of the animal protection laws by weighing the value (educational, scientific, clinical, etc.) of the project against the impact on the welfare of the animals. In most countries, ethics committees function locally, often belonging to research institutions.

Harm-benefit assessment was required for the first time by the Animals (Scientific Procedures) Act 1986 in the UK, however, this law (and all the following) left the operational details open; no detailed guidance is provided on the harm-benefit analysis. While there is a more or less clear agreement on the need for the use of severity scales in harm assessment, benefit assessment and the balancing process are obscure processes (FELASA Working Group on Ethical Evaluation of Animal Experiments, 2005).

Although there is diversity in how committees operate, they seem to function smoothly, a vast majority of applications submitted ultimately gain approval and in a timely fashion after the usual changes (Rice, 2011). Very few scandals regarding AECs have got publicity. However, this does not mean that there is consensus over the good functioning of ethics committees. From the day that these committees were established they have been criticized, partly from the side of animal protection organizations for not being sufficient in the protection of the laboratory animals (Finsen, 1988; Physicians Committee for

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Responsible Medicine, 2011), and also from the side of scientists for lack of expertise, diverted resources, conflict of interest, and restrictions of academic freedom (Steneck, 1997).

Because AEC's play such a central role in the regulation of research with animals and thus in the protection of research animals, evaluating their performance is important. To our best knowledge, no systematic review has addressed this matter before. Our paper aims to systematically evaluate the available empirical studies assessing the operation of AEC's in order to determine what is known about how they function.

Method

Following the search strategy previously applied by (Abbott and Grady 2011) for human research ethics committees, we searched in Academic Search Complete ((DE 'ANIMAL experimentation') AND TX committee AND TX welfare) and in Google Scholar (interview OR survey OR observation AND decision making AND committee AND ethics AND 'animal experiment*') in December of 2011. The searching terms were different in the two search engines, because Academic Search (published by EBSCO Publishing) has an indexing service (giving better hits) but the Google Scholar does not.

The total number of hits was 333. Relevant articles were selected in a systematic manner, based on the information in title/abstract or when necessary in the full text-paper. Thus, a total of 13 publications out of 333 identified references were included in the review. Papers were excluded if (1) instead of AEC's they focused on scientific, philosophical or other topic; (2) if they were not based on empirical methods; (3) had no abstract; (4) were not published in English. This later point unavoidably excluded some studies. For a full list of included papers see Table 1.

Results

The 13 empirical studies used the following methods: interviews with committee members (5 papers), questionnaires (3 papers), observational studies (2 papers), reviews of written documents (2 papers) and protocol evaluations (3 papers) (see Table 1 for details).

A Canadian study examined in detail how the *effectiveness of an AEC* was influenced by committee composition and dynamics, recruitment of members, workload, and participation level and member turnover. The effectiveness was defined in the paper as achieving the mandate of the committee to protect research subjects. This includes meeting procedural standards of committee independence, broad expertise, sufficient depth of review, commitment of members to the mandate, and fair and respectful committee discussion. In this study 28 members of AECs at four universities in western Canada were interviewed and a bias towards institutional or scientific interests was found (Schuppli and Fraser 2007). The authors also concluded that protocol review may be influenced by heavy workloads, type of review process and lack of full committee participation.

Decision-making has been examined *at group and individual levels*; both processes are important for the consistency of the ethical decisions. Canadian AEC members were interviewed on various ethical matters, including ethics, animal ethics, science and ethics, and the use of animals in research, in order to explore their implicit ethical framework.

The results revealed that AEC members hold quite a narrow view on both animal ethics and animal use in research, and that they apply implicit ethical notions, such as respect and justice, when performing ethical evaluations of animal use (Houde *et al.*, 2009). Ideland confirmed (through interviews with Swedish AEC members) that the different personal views on what ethics means, and hierarchies

Table 1. List of included papers with their method and main objectives.

Method	Objectives	Reference
Protocol evaluation	Evaluation of review systems	(Voipio *et al.*, 2004)
Interview	Examining how the effectiveness of a research ethics committee is influenced by committee composition and dynamics, recruitment of members, workload, participation level and member turnover	(Schuppli and Fraser, 2007)
Observation	Investigation of the ethical decision-making	(Houde *et al.*, 2003)
Survey	Analysis of the impact of legal changes on the licensing process	(Kolar and Ruhdel, 2007)
Survey	Evaluation of the impact of the 'just-in-time' process on the IACUC	(Mann and Prentice, 2007)
Observation and interview	Investigation of individual ethical decision-making and examination how policies are implemented	(Schuppli, 2011)
Survey and interview	Investigation of attitude of the committee members towards the assessment of scientific merit and the use of alternatives in research proposals	(Graham, 2002)
Interview	Exploration of implicit ethical framework of IACUC members	(Houde *et al.*, 2009)
Interview	Examining how ethics becomes situated in the context of the committee meeting	(Ideland, 2009)
Review of minutes of meetings	Investigation of how the ethical review modified the applications 1989-2000	(Hau *et al.*, 2001)
Review of minutes of meetings	Analysis of applications for experimental work in animals which resulted in requests for modification	(Hagelin *et al.*, 2003)
Protocol evaluation	Investigation of the reliability of ethics reviews	(Plous and Herzog, 2001)
Protocol evaluation	Investigation of the reliability of ethics reviews	(Dresser, 1989)

among committee members, characterise the meetings. However, committee traditions and priorities of interpretation were also considered important to the decision (Ideland, 2009). Voipo confirmed that there is a large variation between individuals in scoring the degree of costs, benefits and the possibilities of modifying costs, e.g. by introducing an improved or refined technique that is less distressing to the animal (Voipio *et al.*, 2004).

A recent Canadian study aimed to understand how committee members make decisions and how effective they are in *implementing policy and achieving their stated aims*. The primary finding was that the focus of protocol review by committee members was reducing harm to animals, with less focus on the ethical justification of research despite this being stressed in policy as a goal of AECs. The author also believes that AEC effectiveness could be improved by clarifying the elements of harm-benefit assessments and the relation between AEC and scientific peer review(Schuppli, 2011). Graham (2002) made similar findings in a smaller study in 2002, investigating the attitude of US committee members towards the assessment of scientific merit and the use of alternatives in research proposals. The study revealed that it was not clear for the committee members what they should assess in the ethics review.

A Canadian observational study focusing on the *ethical issues debated in the review* revealed that the majority of comments were technical. However, the ethical concerns were implicit in both scientific and technical language, or some of the scientific and technical comments had an impact on the ethical treatment of animals (Houde *et al.*, 2003).

Two studies investigated *how legal changes affect the performance of ethical committees*. Using questionnaires addressed to licensing authorities and members of ethics committees, (Kolar and Ruhdel, 2007) found that the inclusion of animal welfare into the German constitution did not change or changed only to a small extent the decisions. The other study which addressed several issues, aimed to evaluate impact of the 'just-in-time' (JIT) process on the IACUC which is an optional process that allows for submission of a grant proposal with funding dependent on subsequent verification of IACUC approval. The new process seemed to be less successful than was expected. 59% of respondents indicated that they experienced no reduction in workload. Of those who indicated a reduction, the amount of reduction varied from 'little' to 40% (Mann and Prentice, 2007).

Hau *et al.* investigated the minutes (reports) of Swedish AEC meetings held between 1989 and 2000 (n=3,607) to find out about *approval rates*. A great majority of the applications received were approved. However, 18.1% of them were approved only after modifications (Hau *et al.*, 2001). When the applications for experimental work in animals that resulted in requests for modification were further analyzed, it was found that the majority of the changes requested could be classified as 'Refinement'. The results suggest that the work of the committees may be perceived as an ongoing process, since several of the applications for which modification was requested were projects that had been approved on a previous occasion but were now up for renewal (Hagelin *et al.*, 2003).

Dresser (1989) had 32 institutional AEC's in the US reviewing 4 hypothetic protocols involving experimental procedures frequently conducted on animals to check for *reliability of decisions*. Committees were in general in agreement on the need to refine the protocols to minimize pain, distress, and other harm to animals, but there was less agreement in the approach to assessing the justification for laboratory animal use. Apparently, this component of committee responsibilities presented the major conceptual and practical difficulties for committees engaged in animal research review (Dresser, 1989). These results are corroborated in Plous and Herzog's 2001 study, in which 50 US AEC's re-evaluated three real, randomly selected cases, previously evaluated by one of the committees. No significant relation between the first (original) and the second (experimental) recommendation was found. However, for the one aspect for which detailed classification criteria were given (expected animal pain), there was relatively high agreement.

Discussion and conclusion

The reviewed studies show that there is a significant variation in process and outcomes of decision-making at individual and group levels. Individual members have different ethical values which are reflected in their decisions and their contributions to the group discussion. There is more agreement on the assessment of animal harm and on refinement measures to reduce this harm than on how to weigh harm versus benefit. This is in line with the observation that the discussion tends to focus on technical rather than ethical issues.

There are strikingly few empirical studies of the review process for animal research when compared to the number of empirical studies of research ethics committees (REC) for human subjects' research. For example, a recent systematic review of empirical data on evaluation of RECs, limited to the United States, is based on 43 studies (Abbott and Grady, 2011). This present search, without geographical limitation, found only 13. The low number of studies and the fact that the search was limited to English limits the possibility of drawing overall conclusions; however this may partly be compensated by using information on how RECs operate. Many of the fundamental ethical issues and principles in research on animals are similar to those for research on humans (Schuppli and Fraser, 2007) such as the common application of the harm-benefit principle. Because of the obvious similarities between the two entities it has been argued that understanding how RECs function is helpful for identifying and fixing the problems in the

operation of AECs (Schuppli and Fraser, 2007). However, others are sceptical to what extent the quality of decision-making in animal research can be actually improved (Prentice *et al.*, 1988).

Although the included empirical studies cover diverse and important topics, some important aspects of the performance of ethics committees have not been investigated at all. For example, the ethical reasoning behind rejecting applications is an undiscovered field. Orlans pointed out that the review committee's first duty is to identify which procedures are ethically unacceptable irrespective of any knowledge that might be derived (Orlans, 1997). Understanding what types of applications are rejected would help to understand how AEC's distinguish between acceptable and unacceptable research. Another issue which has not been addressed by empirical studies yet is whether and to what extent changes in the structure and the working protocol improve the performance of the review committees. Plous and Schuppli suggested several methods to improve the decision-making of the ethical committees (Plous and Herzog, 2001; Schuppli and Fraser, 2007); however they have not been tested and evaluated.

In this review, we have pointed out how empirical studies of AECs' may help to point out some of the problematic aspects of the animal ethics review process. While we do not wish to challenge the usefulness of the review process, we argue that being aware of the problems is an important first step towards addressing them. Conducting further empirical studies is important because they can provide 'objective' information about how to improve the review process.

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Investigating the existence of an 'Animal Kuznets curve' in the EU-15 countries

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Abstract

The 'Environmental Kuznets Curve' is a hypothesis, according to which environmental burden rises when the income levels are low, but degradation starts to lower when income levels continue to rise. This approach has been utilized also to hypothesize that animal welfare and usage of animals by humans follow a similar trend. In this article meat consumption per capita is examined in the EU-15 context by comparing it with income levels. It was found that meat consumption rises with income in lower income levels but this growth gradually stabilizes. When the amount of animals slaughtered per capita was analyzed it was observed that with income levels of 11,000 US$, 19,000 US$ and 23,000 US$ per capita the amount of animals slaughtered per capita was equal to 6.8, 11.0 and 9.4 respectively. This indicates that the amounts of slaughter do indeed follow the trend hypothesized by the Kuznets curve. However the results should be interpreted with caution.

Keywords: meat consumption, slaughter, income

Introduction

Livestock farming has been related to the emission of nutrients and organic matter as well as pathogens and drug residues into water basins (Steinfeld *et al*. 2006), but also to green house gas emissions (Goodland and Anhang, 2009; McMichael *et al*., 2007). It has been argued that there might be advantages of a plant-based diet also from the point of view of health (Campbell and Campbell, 2004). The economist Kuznets (1955) hypothesized an inverted U-shaped relationship between economic development and income inequality: at low levels of economic development, economic growth increases income inequality, but after reaching a peak a further increase in economic development results in a decrease in inequality. This concept is the basis of the Environmental Kuznets Curve (EKC) theory, which states that environmental stress increases during the first stages of economic development but subsequently decreases (Dinda, 2004). Vinnari *et al*. (2005) first presented an analysis which hypothesized a curve where meat consumption is initially rising together with income values, but decreases after reaching some peak value, thus indeed suggesting that there is an EKC in the context of meat consumption. This analysis was broadened by Frank (2008) who analyzed the existence of an 'Animal Welfare Kuznets Curve' (AWKC), by observing the relationship between income and various empirical indicators of animal welfare. Others have also tested this hypothesis (for example Lombardini *et al*., 2011). As animal welfare as a term is so difficult to define and it has even been argued that improvements in animal welfare can lead to a decrease in animal rights (Francione, 2008), here we analyze an 'Animal Kuznets Curve' (AKC). In the AKC our interest is in the amounts of utilized end product and in the number of animals used. We are thus interested in the amount of meat consumed per capita in the EU-15 countries and how this amount has altered with the changes in income levels. On the other hand we are interested in the relationship between income levels and the number of animals slaughtered per capita.

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Material and methods

Analysis of this article covers the EU-15 countries with a time series from 1970 to 2007. The data source used in this article for meat consumption and the amount of animals slaughtered is FAOSTAT (Food and Agriculture Organization of United Nations Statistical Database), while data for population and Gross Domestic Product (GDP) in constant 2000 US$ was obtained from the World Bank. The time series used was the longest available for all countries. We planned to include all the member countries of the EU-15 group, which means Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and United Kingdom. However, Belgium and Luxembourg had to be excluded as meat consumption and slaughter data for these countries was available only from the year 2000 onwards: it was preferred to have a much longer time series available than to have all countries in the analysis. From now on, when referring to EU-15, it actually means that the data used is that of all EU-15 countries except Belgium and Luxembourg. The focus on EU-15 countries was chosen because the member countries present similar economic development in the time period considered and because of the good data availability. As it was not possible to find data on the actual consumption of meat, we have used its 'food supply': which is defined by FAOSTAT as the sum of production, imports and changes in stock, minus the exports of a certain food commodity. For the rest of the article the term consumption will be used on the basis of this definition. We examined bovine, pork and poultry meat, because they represent 93% (data source: FAOSTAT) of the total meat consumption in EU-15 countries.

The total meat consumption in EU-15 was calculated as:

$$\sum_{i=1}^{n} (domestic\ food\ supply)_{\alpha,\beta,\gamma}$$

where: (1, ...n) = each of the EU-15 member countries
domestic food supply = imports + production - exports - waste
(α, β, γ) = bovine meat, pork meat, poultry meat measured in kg/year

The meat consumption per capita in kg/capita/year, was obtained by dividing this result by the total population of the EU-15 member countries.

The GDP per capita for EU-15 was calculated as:

$$\frac{\sum_{i=1}^{n} GDP}{\sum_{i=1}^{n} population}$$

where: (1, ...n) = each of the EU-15 member countries

In order to obtain the correct figures for slaughter connected with the consumption of a certain type of meat in one country, the following formula was used:

$$\sum_{i=1}^{n} \frac{(domestic\ food\ supply)_{\alpha,\beta,\gamma}}{(domestic\ food\ supply + exports)_{\alpha,\beta,\gamma}} \cdot number\ of\ animals\ slaughtered_{\alpha,\beta,\gamma}$$

where: (1, ...n) = each of the EU-15 member countries
domestic food supply = imports + production - exports - waste
(α, β, γ) = bovine meat, pork meat, poultry meat measured in kg/year

In this way it was possible to eliminate slaughter which occurs to support the exports of a certain type of meat in a country, thus providing useful information when looking at the results for each country separately. We acknowledge that per slaughtered cattle the amount of meat obtained is higher than per slaughtered chicken, but this is not the interest of our analysis as we are interested in the amount of animals utilized in the agricultural system. From the point of view of an individual animal it is not relevant how much meat it will produce. From the animal's point of view the loss of life is the critical factor.

Results

Meat consumption vs. income

When the data was analyzed from the perspective of end product utilized it was noted that that there was only a slight trend towards an Animal Kuznets Curve, as it appeared that while GDP per capita was increasing steadily, the amount of meat consumed per capita had stabilized during the last 10-15 years. A slight decrease in the values was reported after the GDP per capita reached about 20,000 US$ per capita (Figure 1). The results were interpolated with a polynomial trendline of the second order and a coefficient of determination equal to 0.9693 was obtained.

The analysis of the ratio between meat consumption and GDP per capita growth rates in each of the EU-15 countries made it possible to see which countries contributed the most to the general trend. In this case the downward trend occurring in the last years between meat consumption and GDP per capita was given mainly by Austria, Denmark, France, Greece and the Netherlands (Table 1).

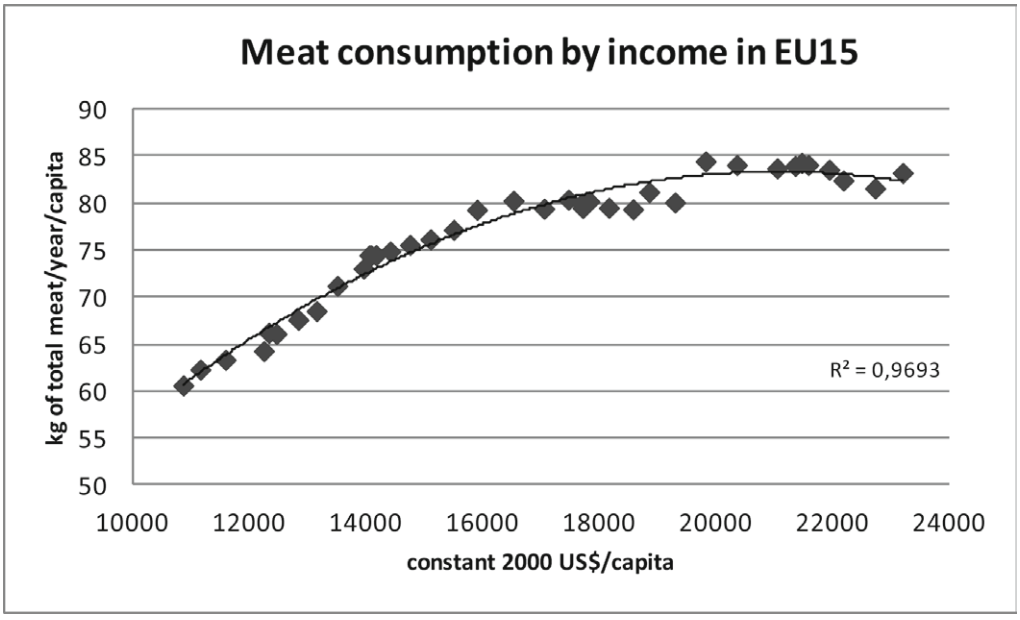

Figure 1. Comparison of meat consumption per capita and GDP per capita (data sources: FAOSTAT and World Bank).

Table 1. Meat consumption per capita and ratio between growth rates of meat consumption per capita and GDP calculated with a 5-year interval (data sources: FAOSTAT and World Bank).

Country	1970-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2007
Austria	82.9	93.1	93.6	102	105.7	112.2	107.7	101.3
	0.56	0.69	0.07	0.69	0.49	0.41	-0.76	-0.90
Denmark	61.6	78.0	82.3	96.3	99.4	111.6	99.0	94.7
	1.82	2.04	0.38	2.48	0.31	8.75	-2.31	-1.04
Finland	54.1	57.1	57.3	61.4	60.4	64.4	69.3	70.1
	1.15	0.37	0.03	0.45	0.30	0.27	0.62	0.13
France	77.1	86.1	84.4	87.6	87.5	90.7	82.7	79.8
	0.37	0.75	-0.39	0.27	-0.03	0.31	-1.99	-1.02
Germany	85.6	93.8	95.6	93.5	80.1	80.0	81.5	84.5
	1.97	1.26	1.13	0.08	1.84	0.80	-8.08	0.51
Greece	41.1	50.7	55.2	55.9	64.6	69.6	63.5	59.6
	4.58	2.69	-20.29	-0.26	12.03	-0.21	-0.44	-0.70
Ireland	70.9	71.3	81.0	81.6	73.1	88.5	96.4	85.3
	0.89	0.03	1.52	0.03	-0.48	0.41	0.46	-1.85
Italy	57.2	69.1	71.9	78.5	76.4	84.1	81.2	84.8
	1.01	0.94	0.48	0.56	-0.43	1.04	52.28	38.39
The Netherlands	63.1	69.6	75.9	81.8	89.8	81.3	72.0	66.0
	0.80	0.92	2.79	0.54	1.17	-0.52	-2.73	-1.18
Portugal	38.0	41.3	39.6	57.4	70.6	84.0	81.2	88.4
	1.58	0.45	-2.11	1.35	3.11	0.92	-3.67	2.70
Spain	49.1	63.1	69.8	84.3	91.7	104.5	100.4	104.4
	0.90	6.07	2.46	0.89	1.40	0.71	-0.44	0.95
Sweden	56.3	60.0	54.2	55.1	61.6	65.6	73.8	75.2
	1.07	1.22	-1.07	0.15	44.30	0.35	1.02	0.30
United Kingdom	59.8	62.7	63.1	64.4	66.6	70.2	77.7	78.9
	-0.38	0.54	0.06	0.13	0.49	0.32	1.01	0.37

There was a significant decrease in meat consumption per capita in some countries: in the case of the Netherlands and Germany total meat consumption per capita reaches a peak of almost 100 kg/capita/year, but subsequently decreases to reach respectively 66 kg/capita/year and 84 kg/capita year in 2007 (Figure 1.). In the case of the Netherlands the turning point took place when the GDP per capita reached the value of about 23,000 US$/capita/year in 1994, while in the case of Germany the turning point was already in 1989, when GDP per capita reached approximately 20,000 US$/capita/year. Less evident but similar trends were found in the cases of Greece, Austria and France.

Number of animals slaughtered vs. income

The shape of the curve when the number of animals slaughtered per capita is plotted against GDP per capita for the EU-15 countries indicates a Kuznets curve for this measure (see Figure 2.). It was noticed that the turning point was in correspondence of a GDP per capita close to 20,000 US$. The number of animals slaughtered per capita reached a peak in 1998, with about 11 animals slaughtered per capita, and subsequently decreased to a value of about 9 in 2007. This was due especially to the changes in

animals slaughtered amount in countries like Spain (from 17 animals slaughtered/year/capita in 1998 to 13 animals slaughtered/year/capita in 2007), the Netherlands (from 13 animals slaughtered/year/capita in 1996 to about 6 in 2007), France and Denmark (both going from 13 animals slaughtered/year/capita in 2001 to about 9 animals slaughtered/year/capita in 2007). The results were interpolated with a polynomial trendline of the second order and a coefficient of determination equal to 0.9173 was obtained. While there is no convention on what should be the threshold of this coefficient to claim that a Kuznets curve exists, the value obtained is sufficiently high to consider such hypothesis well fitting.

The calculation of the ratios between number of animals slaughtered per capita and GDP per capita growth rates pointed out that the most significant changes occurred in Austria, Denmark, France, Greece and the Netherlands (Table 2). These countries were the same that showed a remarkable decrease in meat consumption and a common line in all these countries was that the most significant decrease took place for pork meat and amount of pigs slaughtered. This suggests that in these regions the meat consumption patterns have recently changed in parallel with increasing income levels.

Conclusions and discussion

In this paper the values of income per capita in EU-15 member countries were compared first with meat consumption per capita and then with the amount of animals slaughtered per capita. This was done to test the existence of Animal Kuznets Curve hypothesis, i.e. the inverted U-shaped relationship where the consumption first rises when the income levels rise but after a certain threshold level they would start to decrease. The empirical results for the timeframe 1970-2007 gave some support to the hypothesis that the trends in meat consumption and animals slaughtered follow the shape of a Kuznets curve when compared with a steadily increasing income per capita. For income levels of 11,000 US$, 19,000 US$

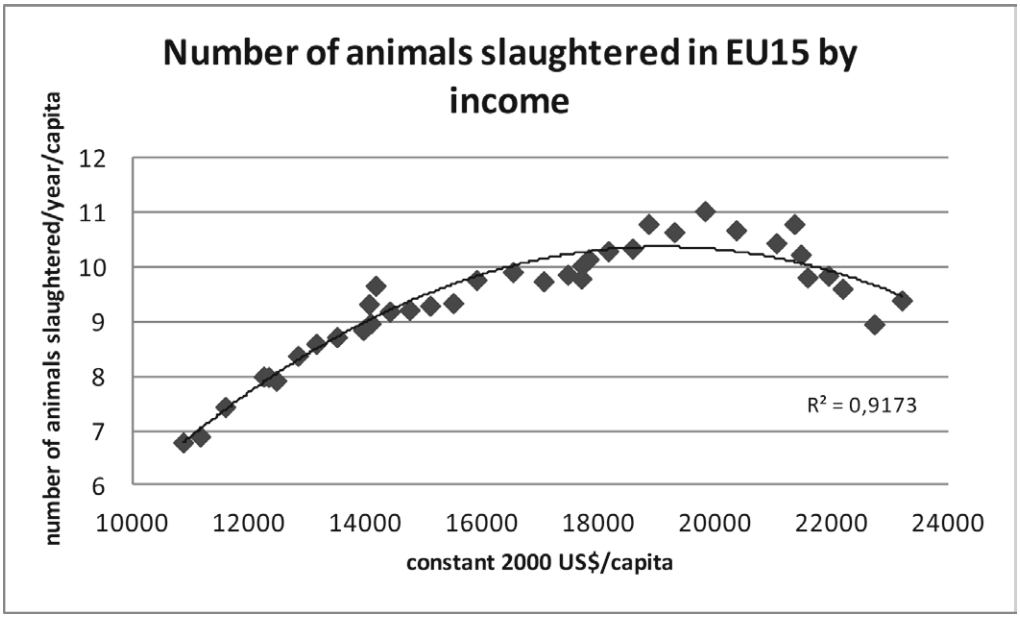

Figure 2. Comparison of number of animals slaughtered per capita and GDP per capita (data sources: FAOSTAT and World Bank).

Table 2. Amount of animals slaughtered per capita and ratio between growth rates of animals slaughtered per capita and GDP calculated with a 5-year interval (data sources: FAOSTAT and World Bank).

Country	1970-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2007
Austria	5.7	7.2	7.8	8.0	9.0	7.8	6.7	6.6
	0.84	1.48	0.97	0.26	1.71	-0.90	-2.57	-0.39
Denmark	5.7	7.5	9.4	9.8	11.5	11.8	11.2	9.9
	1.94	2.45	1.69	0.71	1.63	0.93	-1.02	-2.92
Finland	2.8	3.5	4.5	6.2	7.4	9.0	9.8	9.8
	1.74	1.76	2.44	2.44	-3.48	0.87	0.74	-0.02
France	9.0	10.0	11.4	12.0	12.7	12.6	10.3	10
	0.76	0.67	2.70	0.43	1.35	-0.06	-4.21	-0.87
Germany	5.3	6.4	6.0	5.8	4.5	5.3	6.0	6.4
	1.66	1.13	-0.69	-0.28	-2.65	1.83	4.87	1.25
Greece	11.8	13.0	13.3	14.2	13.5	6.3	9.0	6.3
	2.84	0.67	-1.20	1.66	-3.03	-3.45	2.05	-3.37
Ireland	7.3	8.6	9.3	12.0	14.8	13.8	16.3	13.1
	0.29	1.06	0.83	1.10	1.04	-0.13	0.95	-3.16
Italy	9.3	10.1	9.1	9.9	9.1	8.9	7.0	7.4
	0.88	0.37	-1.22	0.53	-1.28	-0.20	4.49	3.34
The Netherlands	6.5	6.7	10.3	13.1	12.3	6.9	8.3	6.4
	0.27	0.37	16.42	1.88	-0.75	-2.39	4.92	-3.28
Portugal	9.8	11.4	8.9	10.8	17.6	21.4	16.3	18.1
	2.84	0.88	-11.44	0.67	8.41	1.06	-26.32	3.40
Spain	13.2	13.8	14.2	14.3	15.1	16.4	13.1	13.2
	1.07	0.98	0.68	0.03	0.84	0.44	-2.22	0.06
Sweden	5.2	5.7	5.2	5.0	6.4	7.7	7.8	7.6
	3.59	1.83	-1.05	-0.19	103.85	1.04	0.14	-0.49
United Kingdom	7.0	8.0	8.9	9.6	12.4	13.1	13.2	12.1
	0.60	1.55	1.08	0.50	4.21	0.35	0.05	-1.97

and 23,000 US$ per capita the meat consumption per capita was 60.6 kg/capita, 84.5 kg/capita and 83.2 kg/capita, while the amount of animals slaughtered per capita was equal to 6.8, 11.0 and 9.4 respectively.

In some countries the consumption of meat has actually undergone a decrease during the last 10 years and the consumption of bovine meat has decreased or has been constant in many countries (in particular Austria, Finland, France, Germany and the Netherlands). On the other hand, there is also evidence that broilers and pigs have been genetically selected in order to increase their yield of valuable meat. In the case of broilers the main target has been the enlargement of breast size, which is particularly evident in the 'high-yield' broiler currently in use: genetics seem to have a very significant impact on breast size and body weight of commercial broilers, while diet affects only marginally (Havenstein *et al*., 2003). In the case of pigs, genetic selection aimed at increasing litter size, weight gain, decreasing back fat and improving feed conversion, but the more recent trend is towards improvements in retail carcass yield and meat quality, which have high economic value (Van Wijk *et al*., 2005). Genetics and nutrition have played a role also in the rearing of feedlot cattle in order to achieve higher body size: this has been driven by both hormonal implants and energy intake limitation during the growing or finishing period (Owens *et al*., 1995). It can be concluded that factors like genetics and diets characteristics have potentially a significant role in increasing the meat yield from different animals, and this could be one of the drivers

behind the reduction in the animals slaughtered amount during the last 10-15 years of the time series analyzed. As these are only some of the factors influencing this matter, further research on these issues would be needed in order to make our results more robust.

The results presented here can contribute significantly to the discussion concerning the relation between economic growth and the animal issue, but they should be interpreted cautiously.

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The Chinese animal: from food to pet

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Abstract

The purpose of this article is to examine changes in lifestyle that relates to an ethical stance towards animal rights in today's China based on my field work during 2009 to 2010. These changes and the increased consciousness around animal rights must be seen in light of China's rapid and intense modernization, the processes of individualization and urbanization and the development of a market economy consumer culture. The growing middleclass and its increasing political influence is a relevant factor for the ethical stance on animal welfare since it is a forerunner of opinions and ethical standards for other social groups. This is among others expressed in internet based discussion forums where the lines of conflict are between different economic classes and between people with rural and urban origin. Parallel, the government initiates disciplinarian and civilizing campaigns and juridical measures are taken to improve the animal welfare. Even though these juridical steps and the civilizing campaigns can appear trivial, they may be taken as indications of a paradigmatic cultural and political change.

Keywords: China, animal ethics, lifestyles, consumerism, disciplinarian processes

Introduction

In today's China there is an increasing consciousness concerning animal rights and animal welfare. Much of this attention around animal welfare has come as a consequence of more media attention in recent years to incidents of animal cruelty and cruel practices in China's agricultural industry, slaughtering operations, live feeding in entertainment parks and the exploitation of circus animals. With its roots in the urban middle class, it has grown into a social movement focused on the idea that also animals are moral subjects and have rights. With this development is growing new ways of treating animals which find their expression in new ethical approaches to the keeping of animals. Among others, internet based debates exhibit these new normative evaluations of the treatment of animals and how this is expressed in rural and urban, generational and class-based lines of conflict.

This article will see the evolving animal rights and welfare debate as indicative of the rapid changes in China and how social transformation is being reflected in people's attitudes and moral views. It will analyse the recent changes in the normative approach to the animal welfare in China as elements in an encompassing disciplinary process, in the context of processes of individualization and urbanization and the development of a consumer economy. Characteristic for this development is the incorporation, or annexation, of economically and ideologically weaker social strata to normative standards and lifestyles connected with the new elite, the urban middleclass and the economic and political power centres. China's 'outsiders' – being either made up of migrant workers in the large cities such as Shanghai, the generation which grew up under Mao, or the new working class – should no longer eat dog and cat for dinner. It will seek to understand the ethical constitution of people in today's China concerning animal welfare, how they think and behave, how the dominant and official versions of animal welfare are expressed, how these show themselves in conflicts between different normative systems and lifestyles and in this context not in the same degree how people *should* think and behave. In conclusion I will suggest some ethical and judicial implications which are consequences of this development.

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This article is primarily based on observations made from fieldwork conducted in fall 2009 and spring 2010, but other source material includes official Chinese websites, English language newspapers, internet discussion forums, blogs and conversations with residents of Shanghai. Part of the fieldwork comprised of the conducting of 28 qualitative interviews in 2009 and 2010. 15 of the interviews were with students at East China Normal University and 13 were with researchers at, or connected to, the Shanghai Academy of Social Science. The aim of these interviews has not been to end up with conclusive results but rather to outline the direction of the political processes connected to disciplinary processes, individualization, liberalization, etc. in contemporary China. Hence, the general significance of these empirical examples has an explanatory limit regarding the changing dynamics of Chinese politics in general, but can give some solid indications when seen in the context of correlated studies about social movements, internet based protests, corruption, disciplinary campaigns, social unrest, lifestyles, and so on.

The modernized and consumer based animal

New lifestyles and changing normative views on the treatment of animals have grown parallel with Chinese modernization, especially processes of individualization and urbanization. The market and market economy, and with this, a growing consumer economy, have been the central driving forces behind Chinese individualization processes. Urbanization, which has also been definitive for these individualization processes, has taken place to a large degree through the great movement of migrant labour. The modernization of the country has brought about an increased need for a free and mobile labour force; 200-300 million rural people have flooded into the urban centres in search of better paid work and new lifestyles (Saich, 2004). The meeting between the workers of this great migration and urban culture signifies the tensions which have sprung up. New forms of lifestyle tied to a consumer oriented and pleasure based individualism stand in opposition to traditional normative systems.

However, it is not just the free market forces which have caused this development. Paradoxically enough, state intervention in family life during the collectivization period has speeded up individualization processes in China. The Communist Party's attempt to guide individuals' loyalty away from the family and towards the local collectives, and eventually the state, has resulted in a strengthening of individualism. By replacing the family structure with collective structures, the CPC in reality created new possibilities for the individual, due to the partial breaking down of familial loyalty. These two parallel processes have been interoperable in the establishment of a dominant consumer oriented and pleasure based individualism. The party state in China is also the cause of individualization through liberal forms of governance, promoting and supporting individualization processes in the economic and private spheres. The Party has been central in a comprehensive disciplinization of the Chinese populace by replacing Mao with consumerism as an ideology, through, among other tactics, campaigns.

This capitalist growth ideology and market oriented modernization of China's agriculture, industry, science and technology had to be legitimized at the cost of the ideals of production and equality which existed under Mao, now making a break with the cultural and social structural codes the earlier elite embraced (Yan, 2009). The governmentally instituted campaigns of the early 1980's, that were intended to reform political and economic attitudes in the populace in the transition from a planned economy to a market and consumer economy, illustrate this. Through these campaigns, the authorities and mass media encouraged people to take out loans in order to purchase goods and services, a practice which was called 'borrowing money to realize your dreams' (*jieqian yuanmeng*). This stands in contrast to the Maoist ideology in the period before the economic reforms (1949-78), in which 'hard work and plain living' (jianku pusu) was one of the ideals promoted through different information campaigns. The new regime, and the eventual new ruling elite in China after Mao's death in 1976 had to reformulate and reconstruct evaluative terms in this ideological struggle to legitimize economic reforms. Consumerism, therefore, became a new ideology in the 1990's which influenced the daily life of the Chinese successively more

than other normative regimes such as Maoism or Confucianism, and still does. However, the consumer based individualism has not been, as in the West, connected to the development of a rights based individualism through, for example, the welfare state or a constitutional democracy, but it has exhibited many of the same consequences and cultural expressions. For example, proper and stylish consumption has become so important that the knowledge of how to consume has also become a commodity. A series of magazines and newspapers are dedicated to consumer related issues, and one can find consumer elated news, columns and debates daily in all media (Yan, 2009). With this development, the standards for proper, civilized and good behaviour have changed, and these development characteristics have provided new and various lifestyles, and steadily more differentiated ways of expressing one's individuality. In a context such as this, the growth of the Chinese animal protection movement and the increased attention to animal welfare must be understood as being to a greater degree than earlier, connected to ethical consumption.

From food to pet

Chinese food production, and the socio-economic context it happens in, changes quickly in reaction to, especially, the market economic consumer culture which has mainly developed in the eastern metropolises, for example, Shanghai and Shenzhen. Food production in China shall no longer merely satisfy a starving populace, but also serve national, district political, cultural political, and ethical and animal rights goals. At the same time, the treatment of animals is tied to new patterns and standards of consumption. The keeping of animals has become more varied and they are no longer just for eating. It is more and more common to keep dogs and cats as pets – something which also changes the view of these animals as food. Increasing wealth has given the urban Chinese the time and economy to keep pets in a different way than previously. China's 'one child' policy has also stimulated the demand for domestic pets, making an increasing number of Chinese more sympathetic to the needs and welfare of animals (Hobson, 2007). This must be seen in the context of that, strong taboos are appearing against eating pets.

Traditionally, song birds were kept as pets, while the majority of other animals were eaten. It is common to see people taking their birds with them to the parks, and it has been quipped that China is the only place in the world where people go for walks with their birds, but eat their dogs. In Chinese, animals are called *dongwu,* directly translated as 'an object which moves'. Pets in Chinese, *chongwu*, means directly 'an object you pamper'. A female informant in her early 30's remembered from her text book in biology class in grade school that after the description of a tiger as striped and the largest cat, it was written: 'it is eatable'. This illustrates the previously instrumental view of animals in China. This is swiftly changing, and the attitudes and feelings towards treatment of animals are increasingly varied, and animals are no longer just for eating. It is more and more common to keep dogs and cats as pets. Having a dog as a pet in Shanghai, for example, has increased dramatically. One must still register dogs with the local police station, but a law from 1993 made it easier to keep dogs and the distribution of licenses was further liberalized in the spring of 2011. In Beijing the number of licensed dogs has risen from 150,000 in 2003 to 900,000 in 2010.

Before the Olympic Games in Beijing, China was criticized for its animal protection, or rather, its lack of it – mostly by Western animal rights organizations. There was especially focus on the fur industry and that the Chinese eat dogs. In the traditional Chinese culinary culture based on ideas of balance, the eating of dogs is understood as having positive medical effects, such as increased blood circulation in the winter. In China, which in modern times experienced serious hunger, as during the 'great leap forward' in which 40 million died, perhaps the Chinese relation to food be summed up in the somewhat self-ironic saying that in certain places, such as in Guangdong, 'they eat everything with four legs that is not a table'. This is now changing and parallel with this development there is a steadily growing number of non-profit organizations concerned with animal rights.

The welfare of the Chinese animal

The changed mind-sets towards the treatment of animals in China are illustrative of how social and cultural phenomena are in constant flux and how cultural changes could be understood as disciplinarian processes. Parallel to the development where animals are to an increasingly degree constituted as also pets and not just as food, is the rise of steadily more non-profit organizations which are concerned with animal rights. One animal rights organization, the Chinese Animal Protection Network, has had a central role, and, among other issues, profiled itself as a part of the growing movement against the eating of cats and dogs. The animal rights organization Animals Asia has played a similar role. They are particularly active against the industry which uses the Asian black bear (the moon bear) for the production of bile, which is used in traditional Chinese medicine. These movements make up an important part of the growth of social movements in China today, and illustrate the cultural and social tensions that have followed in the wake of the intense modernization and the increasing individualistic consumer culture in the country. On the one hand, these movements are influenced by, and can be compared to, western animal rights organizations. While usually in opposition to traditional Chinese culture, at the same time they have commitments that must be understood in a Chinese context, concerning, for example, the fights against eating dogs or the protection of the Asian black bear.

Other protests and movements connected to animal protection are of a more symbolic and individual character; videos which show animal abuse have been especially definitive for increased attention to animal rights. Emblematic for these events are the protests in 2006 against a woman who abused a cat. On a heavily visited internet forum a picture of a woman beating a kitten to death with a high heeled shoe was published. The picture became widely distributed to all the largest Chinese internet forums, and new net-based groups with thousands of members were engaged in the case. The woman was eventually arrested (Hansen and Thøgersen, 2009). The massive reactions the wake of other highly publicized animal cruelty incidents also illustrates this, such as a puppy microwaved alive in Sichuan in 2002, or bears at Beijing Zoo being attacked by a student with a concentrated acid that same year (Li, 2005).

This development and the increased consciousness around animal rights must be seen in connection with the growth of a civil society, with volunteer organizations and spontaneously organized actions outside of the state structures. All of this type of activity had earlier been strongly regulated, but are no to a higher degree entrusted to individual initiative. In recent years, the authorities have to a larger degree tolerated that citizens form organized groups, especially in areas where the government needs extra volunteer effort such as the running of schools, kindergartens, and health services in poor areas. Elisabeth Economy even indicates, in the book *The River Runs Black* (2004), that these emerging environmental movements in China can have a decisive political import by drawing parallels to how activism connected to environmental movements was a participant factor in the dissolution of the Soviet Union and the transition to new constitutions in Eastern Europe. Also Li (2006) emphasize how autonomous animal NGOs and animal advocacy groups represent part of new societal forces and contribute to the rise of civil society in China. This development must also be seen in connection with growing the middleclass and its increasing political influence in China (see among others, Saich, 2004; Gu and Goldman, 2004). The Chinese middleclass grows in step with the growth of its economic and political power, and with such a perspective, it will, as a group, attempt to incorporate other groups. This incorporation or integration occurs through an assimilation of economically and ideologically weaker social strata to standards and ways of life developed by elites in economic centres of power (Elias, 2000). This is also the case in the disciplinarian processes concerning animal protection where the animal activist movements mainly consist of representatives from the urbane middleclass. The lines of conflict are also here between urban and rural areas, migrant workers and those who have permanent residency (*hukou*) in the large cities, generations, classes, etc. These are lines of conflict which unfold primarily as fear of downward social mobility and through self-discipline (Engebrigtsen, 2006).

These lines of conflict also find expression in various internet debates in which discussions on animal rights can span from questions concerning the protection of rights and whether animals can be recognized as feeling creatures to whether dogs should be pets or food. One participant points out on the website sina.com.cn that pigs, cattle and chickens are raised, slaughtered and eaten in the West, so why cannot the Chinese eat dogs? He rhetorically asks, 'Are dogs superior to other animals?' This raises questions in what ways and which animals are constituted as worth protecting and which are not. For example, the Moon Bear has a strong symbolic function for the Chinese animal rights organizations, and can be compared to how another Chinese bear, the Panda, has been one of the major symbols of the animal rights movement. Some maintain that it is, for the time being, unrealistic to enact animal protection and rights for animals as do western countries, seeing this in context of the Chinese path to modernization and the growing difference between rural and urban areas. As one participant said on the Chinese website sina.com.cn: 'If all animals were treated in accordance with its stipulations, their living conditions would be better than those of people in impoverished areas'. This presents the encompassing argument that animal legislation must be based on, or in line with, the social and cultural level China is currently at, remembering that the country currently defines itself as a developing nation. Humans come before animals in this development, and their welfare and rights must be secured first.

Discussions concerning to what degree China should allow itself to be influenced by western modernization and lifestyle express a fundamentally pragmatic approach to these questions. As one informant expressed it: 'We should learn from Western legislation on animal welfare, but we should not entirely copy them'. This is an expression of a pragmatism which balances a scepticism for all things western with the recognition that much of it is useful – an attitude which can be summarized by the Chinese expression *Zhong ti xi yong*: The core and fundamental principles in all learning shall be Chinese, while it is acceptable and desirable to learn practical and useful things from the West (Galtung, 2009).

The types of debate as shown above have also taken place in more academic forums. Qiu Renzhong, a professor at the China Academy of Social Science, promotes in a 2002 article changes in attitudes and policy regarding the question of animal rights. This should happen through a steady improvement of animal welfare, animal protection education, law enforcement, etc. Zhao Nanyuan, professor at Tsinghua University, rejects the view, in an article of the same year, that animals are sentient beings and that they are self-conscious, thereby the subject of right. Zhao sees animal advocacy as concealed neo-imperialism (Hobson, 2007). This claim of cultural imperialism is supported by the circumstance that many of those working with animal welfare in Hong Kong and mainland China are white expatriates. This is a general trait in the academic groups who are vocally anti-animal welfare: Chinese scholars are discussing the question about animal rights because of Western cultural and political pressures where the concept of animal welfare and the legislation aimed at protection of animals is claimed to originate in the West and thereby reflects Western culture, productivity level and legal design.

Discussion

The changes in lifestyle that relates to an ethical stance towards animal rights and the increased consciousness around animal rights must be seen in light of China's rapid and intense modernization, the processes of individualization and urbanization and the development of a market economy consumer culture. The growing middleclass and its increasing political influence is a relevant factor for the ethical stance on animal welfare by being a dominant group seeking to assimilate other groups to their normative standards and way of life, for instance through transferring their views on animal welfare to rural migrant workers. This is expressions of civilizing processes which involves the guiding of individuals through increasing degrees of self-governance and self-control (Elias, 2000). This is a type of liberal disciplinary process that is rooted in self-control, and which also must be seen in light of the Chinese network culture (*guanxi*) and the shame which follows from a loss of self-control. Conflicts expressed through fear of

downward social mobility are not only conflicts within individuals themselves, but are also a struggle for normative definitional power and dominance between groups. This will not, however, happen as a conflict-free fusion, but rather through dominance and displays of power in which the effects can strike in both directions and not as a one-way process. While the authorities take conscious actions to be more compatible with the West and adapt to an individualistically based consumer ideology, and the growing middle class adapts to these changes by new lifestyles, the interaction between the government and the different social, economic and cultural groups will deliver a pattern of change which is historically and culturally unique.

However, even though the government instigates measures and is making environmental steps, the ethical consciousness concerning animals which is now on the rise, has not yet equally penetrated the judicial system. It is true that the Moon Bear has gained a greater legal protection than it had 10 years ago. The government has also been regulating circuses and zoos. For instance, since October 2010 it is no longer legal to purchase living lambs or piglets to feed to lions or tigers for its entertainment value. However, the animal welfare movement will emphasize that China's animal welfare laws are few, vaguely formulated and mostly stating principles and without operationalized welfare requirements such as slaughtering methods, transportation amenities, etc. Animals are also to a large degree still constituted in the legislation in instrumentalistic ways and thereby making the law inadequate to deter acts of animal cruelty. Considering the development of the changes in lifestyles and the increased consciousness around animal rights this is expected to change.

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Section 18. Ethics teaching

Bringing animal ethics teaching into the public domain: the Animalogos experience

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Abstract

An increasing number of academic researchers blog – most as a form of science communication to a wider public. This tool is particularly interesting as it provides a way for scientists to communicate directly with a public rather than depending on journalists. When we launched Animalogos (animalogos.blogspot.com) in December 2009, our main aim was to establish a forum of communication for people working professionally with animal ethics and animal welfare, in order to provide a Portuguese-language professional perspective on issues previously almost exclusively commented on by animal rights and animal protection NGOs. Increasingly, we have also integrated the blog into animal ethics teaching, where we now use it as the main examination tool in the animal ethics discipline of two courses: a postgraduate course in animal welfare and an undergraduate course in veterinary medicine. Individually, students have to write a comment to one of the existing blog posts, a comment which is published by the students themselves. In groups, they have to write a post on a topic of their own choice, which is published after revision. For examination purposes, the texts thus produced by the students are evaluated as a short written essay. Whether to be anonymous or not is the students' own choice. Using the blog as a resource for teaching and examination started as a pilot project during the academic year 2010/11, during which the method was evaluated from the teachers' perspective. The main advantages with involving students in the blog activity is that firstly students get to make a real contribution to the public debate and secondly that this draws attention to the blog. The main disadvantage we observed was that most posts written by students require substantial revision before they can be published, sometimes resulting in negative reactions from the students. Continuing the project in 2011/12, we have asked feedback from students. Overall, they view the experience as positive and consider examination through writing for the blog preferable to traditional exams (written or oral), essays or oral presentations. More than half of the students would like this examination approach for more disciplines within the course they are taking. All respondents think that anonymity should be an option when they are writing for the blog.

Keywords: blog, communication, animal ethics, animal welfare, higher education

Introduction

A blog (short for *weblog*) is a 'web site that contains an online personal journal with reflections, comments, and often hyperlinks provided by the writer' (Merriam-Webster dictionary). Blogging is one of the many features of the internet-based communication means known as Web 2.0 which enables users to contribute with their own resources. While particularly prominent in entertainment and social interaction, Web 2.0 is increasingly being used as a learning tool (Sandars, 2007) both to enhance students' learning experience (Boulos *et al.,* 2006) and to promote professional lifelong learning (e.g. Dale *et al.,* 2011).

Most EurSAFE conference attendees have probably contacted with a blog at some point – as readers, writers or simply as consumers of mass media discussions of the phenomenon. An increasing number of scientists blog and they do it for a variety of reasons. Some are relatively personal and internal: a need

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for ventilating and sharing experiences of academic life beyond the coffee room of the own institution. But most science blogs are directed towards a wider audience and are a form of science communication.

The blog is particularly interesting as it provides a way for scientists to communicate directly with a public rather than depending on journalists – thus choosing themselves which topics to address and how to present them. When we launched Animalogos (animalogos.blogspot.com) in December 2009, our main aim was to establish a forum of communication for people working professionally with animal ethics and animal welfare, in order to provide a Portuguese-language professional perspective on issues previously almost exclusively commented on by animal rights and animal protection NGOs. The team behind the blog consists of a senior scientist in animal welfare and ethics and two PhD students in the same disciplines. In addition to working together in research, we share a passion for writing and communication, and all of us were already active on the Web 2.0 using other blogs or Facebook in a semi-professional context.

The professional perspective is a key feature of Animalogos and this was also the basis for involving the blog in our respective teaching of animal ethics to students of veterinary medicine and animal welfare. This approach is particularly relevant for final-year students, who are at a point in their career from which they will actually be acting professionals and our colleagues in less than a year. This means that on the one hand they have most of the required knowledge while on the other hand they need to practise the skills necessary to participate in the public discussion on controversial topics linked to their professions. Usually, these skills are practised through interactive exercises such as group discussions and role plays, whereas knowledge is examined in the form of essays, oral presentations or exams. However, we argue that keeping animal ethics within the closed classroom environment does not make full use of the potential that highly qualified students have of producing material that can contribute to an informed public discussion.

The aim with the present paper is to present our experience of using a thematic, academic/professional blog as a resource for animal ethics teaching. The paper is not intended as a detailed academic analysis of this endeavour but as a basic introduction and evaluation of an approach we have found useful and which we hope can inspire colleagues in other countries.

How we use Animalogos in teaching

The blog is used in animal ethics teaching in two courses:

- MSc in Veterinary Medicine, Escola Universitária Vasco da Gama, Coimbra, Portugal (final-year students); Animalogos used in one edition (May 2011).
- Post-graduation course in Behaviour and Animal Welfare, Instituto Superior de Psicologia Aplicada, Lisbon, Portugal (adult learners with an animal-related profession); Animalogos used in two editions (Nov. 2010, Nov. 2011).

In both courses, writing for Animalogos serves as the examination for the students. This is preceded by a teaching period in which the students are exposed to the theoretical content of the respective disciplines, principally through lectures and the interactive on-line resource Animal Ethics Dilemma (Hanlon *et al.*, 2007). The objectives of the ethics discipline in the respective courses are presented in Box 1.

The examination involves two tasks: individually students have to write a comment to an existing post on Animalogos and in groups of three they have to write a new post for later publication on the blog. An extensive tutorial is handed out to the students during the teaching period; this tutorial explains what to consider when writing for the blog as well as the main criteria used by teachers when evaluating students' performance (Box 1). Depending on the course, recommendations are also made in terms of

Box 1. Teaching objectives for animal ethics. The text in italics indicate the aspects that are primarily covered by the blog writing exercise.

Teaching objectives

MSc in Veterinary Medicine, EUVG

- *Promote the students' critical thinking by inviting them to indentify, analyze and reflect on the different ethical questions involving the use of animals.*
- *Be able to discuss, confront different opinions and understand the point of view of other people.*
- Be able to apply the veterinary Professional code of conduct.
- *Develop a personal ethical reasoning based on correct observation of facts and values.*

Post-graduation course in Behaviour and Animal Welfare, ISPA

- Know and be able to use the learning tool 'Animal Ethics Dilemma'.
- Know the main philosophical basis for animal ethics: utilitarianism, relational view, animal rights, respect for nature, contractarianism.
- Elaborate and recognize the individual ethical profile and its consistency when facing different ethical dilemmas.
- *Promote the students' critical thinking by inviting them to indentify, analyze and reflect on the different ethical questions involving the use of animals.*
- *Analyze and discuss ethical dilemmas specific to the areas of farm animal production, companion animals, wild animals in captivity as well as environmental ethics.*

topics to be explored. The final mark is calculated as 2/3 of the score of the individual contribution plus 1/3 of the group contribution.

The student perspective

To evaluate the students' perspective, an on-line survey was distributed by e-mail to the 21 participants in the second edition of the Postgraduate Course in Behaviour and Animal Welfare, ISPA, Lisbon in January 2012. The survey took place 1.5 month after the students had finished the discipline, and at the time of completing the survey they knew that they had been approved but did not know their final mark. During the week that the survey was open, 16 respondents completed the survey.

Familiarity with blogs. Prior to the course, the students were not very familiar with blogs in general (2 students read blogs once a week or more, 12 students read some type of blogs less than once a week, 4 students never read any type of blogs) or with Animalogos (12 students did not know the blog, 2 thought they had seen it before, 1 was an occasional reader).

Blogs as a source of information. The students had an overall positive view of professional blogs in general and of Animalogos as regards accessibility (general 4.3; Animalogos 4.4; maximum score 5), credibility (general 3.9; Animalogos 4.2) and impartiality (general 3.2; Animalogos 3.6).

Examination using Animalogos. All students found it an overall positive (10 respondents) or very positive (6 respondents) experience. The majority of students expressed that they would like to be examined using this approach in other disciplines in the course (12 yes, 4 don't know/don't answer). They also consider

Box 2. Summary of the information provided as guidelines for the students when preparing their contributions to the blog.

Ethical thinking when writing for Animalogos

When writing a text on ethics, the following is needed:
- appropriate use of technical and scientific knowledge;
- communication skills;
- ethical reflection with appropriate use of ethical principles and professional norms.

Ethical reflection is characterized by being:
- reflective:
  - more than merely expressing an opinion; reflective equilibrium;
- coherent:
  - consistency; treat equally relevant facts/arguments equally;
- informed:
  - appropriate use of scientific, technical and legal knowledge;
- unbiased:
  - considering different viewpoints;
  - defending universal principles.

Evaluation of texts

Evaluation is based on the following criteria:
1. originality;
2. scholarly quality of the content;
3. language;
4. critical thinking;
5. additional enrichment through links, references and audiovisual material.

examination through writing for the blog preferable/much preferable to traditional exams (written or oral), essays or oral presentations (average 4.2; maximum score 5).

Anonymity. The students expressed some ambiguity in relation to the question of making their identity public. When presented with the statement that revealing personal opinions publically is a potential problem, 7 students agree completely or partially whereas another 7 disagree completely or partially. All respondents think that anonymity should be optional when contributing to the blog as part of the examination.

Difficulties and advantages. As difficulties, several students expressed that their lack of experience with this evaluation method made them unsure about what was expected, and unsure what to do when the (ethical) view they expressed were different from that of the teacher(s). However, they also found the method innovative and appreciated the way that they were stimulated to make more general reflections on the topics addressed in the discipline.

How the teaching use affects the blog

The effect of involving students on the blog dynamics can be evaluated through the statistics for page views as well as comments made to the blog. Both these measures show that the students contribute greatly to the dynamics and interactive nature of the blog.

The page view statistics show a distinct peak at each of the three periods in which the blog was used in teaching (Figure 1).

During 2010 and 2011, a total of 318 comments were made to different blog posts. Of these, 146 were written as part of a dialogue between an external contributor (the vast majority of which were students) and an Animalogos team member, 143 were comments written by one of the Animalogos team members to a post written by another team member and 29 written by other external contributors. Thus, dialogue with students represented approximately half of the discussion.

Discussion and conclusion

Including Animalogos as a resource for teaching had several positive effects. In terms of blog dynamics and visibility, the number of page views doubled during the periods when the students used the blog in teaching and the public dialogues in which the students participate correspond to approximately half of the discussion on the blog. Having this kind of continuous interaction with the students enabled us to bring the teaching experience out of the classroom environment and to extend it in terms of time and space.

The students are generally positive to this form of examination and they appreciate the way that it stimulates them to develop an ethical reflection. It is very rewarding to realize that students prefer the experience of writing for the blog to having traditional exams, essays or oral presentations. For us as teachers, this examination form is more demanding than traditional written or oral exams. It is challenging and time-consuming to make a correct evaluation of texts that vary widely in content and form. To maintain the dynamics of the blog, we also need to keep up with and respond to comments as they appear on the blog. Additionally, the posts written by students often require substantial revision before publication.

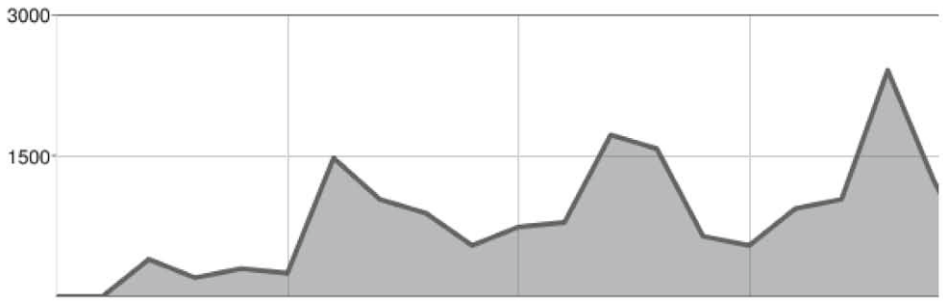

Figure 1. Page views per month May 2010 - December 2011. Each of the three peaks corresponds to a period in which the blog was used for teaching.

However, the extra demand this places on us as teachers is compensated for by the contribution the students provide to the blog. They are clearly competent participants to the public discussion which they enrich with new ideas, perspectives and facts. From our perspective as blog editors, we see an immediate gain in increased dynamics, diversity and visibility, and we hope that some of the students also continue to read the blog after the course.

In terms of teaching objectives, the blog writing exercise tests primarily the students' capacity for critical thinking, argumentation and discussion, as this student comment summarizes: 'Being evaluated through the writing of a comment and/or a post obliges one to reflect on the themes and stimulates thought in a way that is completely different from the typical study for an exam, in which one tends to focus on the topics addressed in class.'

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Teaching sustainability and ethics

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Abstract

The concept of sustainability is well-known worldwide, earning a lot of agreement, whereas there is less consensus about its concrete implementation. Many research projects focus on special aspects of implementing sustainability, while only very few focus on the underlying ethical questions. However, these are crucial for all efforts in implementing sustainability. Considering alumni from universities in their role as multipliers of expert knowledge as well as subjects of responsibility, academic education needs to include teaching the subject 'sustainability' with its ethical foundations. Therefore, at the Centre for Basic Studies in Ethics and Philosophy at the University of Freiburg, teaching sustainability from the viewpoint of ethics has been developed and tested in the framework of the project 'Accepting Responsibility' since 2005. Starting from elective courses for bachelor students of all subjects, the concept has meanwhile been extended to compulsory courses for master students at the Faculty of Forestry and Environmental Sciences. In these courses, students are successfully sensitised for ethical topics inherent to the concept of sustainability like equity and justice, the moral value of nature, rights of future generations and others. Students are given background in ethical theory which is closely linked to the practical aspects of implementing sustainability. Through the course they acquire the ability to reflect about sustainability's ethical aspects and make well-founded decisions based on these reflections. Alumni skilled this way will be well equipped for coping with global challenges.

Keywords: responsibility, ethical competence, applied ethics, academic education, cooperative learning

Sustainability as an ethical concept

Since its creation in the Brundtland Report, the concept of sustainability has become well-known worldwide, earning a lot of agreement, whereas there is less consensus about its concrete implementation. Many research projects focus on special aspects of implementing sustainability, while only very few focus on the underlying ethical questions. As these are essential for answering the question why we should aim for sustainability, they are crucial for all efforts in implementing sustainability. If there were convincing reasons to deny our obligation towards future generations as well as towards people in other parts of the world, the discussion about sustainability would be needless. Many decisions in the context of sustainability are implicitly based on ethical ideas – without referring to ethical theory. To analyse the underlying ethical concepts of sustainability strategies and to construct a philosophically based 'theory of sustainability' (Ott, 2004) is an interesting, important and rather neglected task.

The issue of sustainability is one of the very important topics in the field of applied ethics. The discussion on the different aspects of sustainability, among these the ethical foundations, is inevitable under the conditions of post-normal science, where 'facts are uncertain, values in dispute, stakes are high and decisions urgent' (Funtowicz and Ravetz, 1993). Challenging circumstances like this – nevertheless – need responsible decision making.

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Why responsibility is a key notion for the development of modern societies

Discussing the complex terms and conditions of professional life in modern societies certainly leads to questions of responsibility. University graduates are expected to be able to make responsible decisions; university and schools are the places where they are expected to acquire these abilities.

If we reflect on responsibility, we have first of all to distinguish moral responsibility from other forms of responsibility, e.g. responsibility connected with a certain professional role. We have to define what is meant by moral responsibility and to clarify the subject and scope of responsibility. The question as to how moral responsibility is defined will depend on the moral theory one refers to. The question of how to act responsibly will depend on the professional field the person is working in; it depends on professional expertise as well as on ethical knowledge. Or put another way, we assume here that the question of adequately accepting responsibility is far less a question of leading a virtuous life than a question of cognition and recognizing the best option.

If we consider the subjects of responsibility, we have to take into account that individual actors may be limited with respect to their freedom to decide and act. The question of how and to what extent such a thing as institutional responsibility does exist is only one theoretical problem we are concerned with here (Lenk and Maring, 2001). Moreover, we have to identify the limits of responsibility. Discussing the scope of responsibility comprises the spatial and temporal dimension. It also has to face, especially for professionals in research and development, how to deal with the factors risk and uncertainty (Skorupinski, 2004; Skorupinski and Ott, 2002).

Students must be in a position to reflect on the meaning of responsibility with respect to their academic studies as well as with respect to the implementation and societal impacts of their later professions. Responsibility is a topic for any occupational field students may be involved in.

Enabling students to reflect on their responsibility means to impart a key competence for their later professional life. For this purpose students have to be introduced in solid theoretical knowledge, to be trained to communicate by argumentation, to take on the perspective of others, to act sensitively in cases of conflict and to make rational judgments. The ability to reflect ethically is a key to dealing with modern societies and the dynamics of their development (Düwell, 2004).

How ethical competence can be integrated in academic education

Since 19 June 1999 in Bologna there has been an ongoing process of construction and development in the area of higher education. It is common to all bachelor degrees at German universities that students complete a third field of study, besides their major and minor subjects, in which they attend courses that they choose according to their own interests.

In the education of bachelor students in the federal state of Baden-Württemberg, the studies of the specific subjects are complemented by courses from an area called 'key qualifications' or 'key competences', imparting so-called 'soft skills'. As it is pointed out above, the ability to analyse complex problems in professional life, to understand ethical conflicts and to accept responsibility must be considered a key qualification (rather than a soft skill). Therefore the project 'Accepting Responsibility' was launched to conceptualise courses in applied ethics in general and to teach the subject of sustainability in particular.

The curriculum aims to promote both the ethical understanding and judgment of the students, as well as their willingness to accept responsibility with regard to their future profession. Students are motivated and prepared to accept responsibility in their chosen career and to do so both independently and as a

result of conscious ethical consideration. The courses are focused on competences; the aim is to convey not only knowledge, but to nurture the competence to adequately deal with ethical professional conflicts (Berendes *et al*., 2007).

Doing this we had the chance to make use of the experiences with the 'Basic studies in ethics and philosophy' for teachers, successfully practiced since 2001. The courses are to impart the ethical literacy necessary to enable teachers to recognize ethical matters in the context of both the sciences and humanities. Future teachers will be equipped with tools necessary to integrate the teaching of facts and the ethical dimension in their classes.

According to Mandry (2004) courses that impart ethical knowledge and competences to students of different subjects have to strive for the following goals:

- Students grasp general ethical terms and principles and can apply those to concrete problems.
- Students develop the ability to argue on ethical issues. They are able to respond to different ethical positions and tackle them discursively.
- Students understand that applied ethics is necessarily an interdisciplinary enterprise; they are able to articulate themselves on the basis of their expert knowledge. They realise the independence of each perspective, including the ethical one.
- Students understand the characteristics and scope of ethical theories and judge case studies on the background of theoretical knowledge.
- Their motivation to reflect on moral and ethical questions is supported by their knowledge.
- They are supported in their ability to decide and act responsibly.

For this reason courses have to be low-key with respect to the premises and principles being taught. Previous knowledge in philosophy and ethics is not presupposed, as the participants come from a wide range of study and degree programs. Nevertheless, the courses are scientifically ambitious, as they are taught with a view to ethical knowledge and competences, and with respect to the state of the art knowledge in the theory of ethics and applied ethics. This is also true for the courses, being designed in the context of the project 'Accepting responsibility' for bachelor students. They fulfill three additional requirements:

- They are specifically designed with respect to different occupations. Students have the opportunity to choose courses on ethics that are particularly constructive for their future occupation.
- They develop the ability to be able to work in interdisciplinary fields and support the integration of knowledge and other competences acquired in the students' main subject of study.
- They are closely intermingled with reality and practice. The topics are taught in a problem-oriented manner and on the basis of examples that are relevant to the current socio-political climate.

Sustainability as a major case of applying ethics

Within the framework of the project 'Accepting Responsibility' a course for bachelor students has been developed focussing on the ethical aspects of sustainability.

The course is divided into four parts. The first part is working on the ethical fundaments of the concept of sustainability: Can sustainability be regarded as obligatory and if yes, by which arguments can this be justified? So-called 'no obligation arguments' are analysed and rejected. But is the rejection of contra arguments already sufficient as pro-argument? Students are confronted with the philosophical problem of justifying the obligation towards future generations and thus be sensitised for the dimension of the problem.

Not only the question of future generations but also the inclusion problem – which elements of nature are to be included into the moral community – is discussed. Is sustainability a mere anthropocentric concept or could higher animals also be included? This would lead to far reaching consequences for our indirect duties towards higher animals like elephants or tigers with regard to their habitats.

As one possibility how to justify the obligation towards future generations, the idea of the veil of ignorance (Rawls, 1971) is presented in its temporal interpretation. Beyond the fundamental question if there is an obligation at all, the question of the extent of our obligations towards future generations is discussed against the background of the philosophical debate about egalitarianism and non-egalitarianism (Krebs, 2001). Should absolute or comparative standards be used to define the extent of our bequest package? The answer to this question can lead to very different consequences regarding our efforts of saving resources for future generations.

The focus of the second part is on the conceptional level. It explains current conflicts within the debate about sustainability. For example, the conflict between so-called 'weak' and 'strong' sustainability is discussed. Following the approach of strong sustainability, the need to save as much natural capital as possible is evident in order to allow future generations enough options, whereas the concept of weak sustainability refers mainly to an economic concept that relies on the assumption that natural capital (e.g. forests, fish, water resources) can be substituted by artificial capital (e.g. technology, machines) to a rather large extent.

Furthermore, the competing sustainability concepts of 'one-pillar' (only ecological) or of 'several-pillars', including mostly the economical, ecological and social dimension, are compared and analysed. Whereas 'one-pillar' models postulate the predominance of one dimension (mostly the ecological one), 'several-pillar' models refer to the equality of all dimensions. Whereas the first concept assumes that without giving priority to the ecological dimension, all the other problems cannot be solved, the second concept could lead to the misunderstanding of sustainability as a wish list furnished from an economical, a social and an ecological viewpoint.

The third part deals with the question of implementing sustainability. The three ways to fight the resource problem – efficiency, sufficiency and consistency – are analysed and compared. Efficiency as rather technical optimisation of the input-output-relation is opposed to sufficiency as a more personal change of consumption patterns in order to reduce the use of natural resources. Both are completed by the strategy of consistency, which can be seen as an attempt to avoid problematic material fluxes at all (Huber, 2000). In the course, the question which strategy is the most effective is discussed as well as the question whether the strategies complete each other or can be regarded as competing and therefore excluding each other.

The question of 'sustainable lifestyle' in general is discussed as well as the question about the adequate means to promote a more sustainable lifestyle in western countries. The conflicts involved are summarised under the keyword 'eco-dictatorship'. Is it necessary to force people by laws or other restrictions to live in a more sustainable way or is this a contradiction to our understanding of democracy?

In the last part the theory of sustainability is transferred to concrete areas of application. Against the background of already acquired knowledge, students work on topics they can choose amongst a variety of proposals, including for example sustainable fisheries, carbon offsetting, agro fuel, the just allocation of CO_2-emission allowances, virtual water, sustainable consumption, biodiversity as natural capital, climate engineering, food and sustainability, sustainable mobility, etc.

These topics are worked out within groups of three to five students who prepare a presentation of 75 to 90 minutes. The group work itself as well as the presentation and discussion within the class create a direct link between the theory of sustainability and the students' personal and (anticipated) professional perspective.

The didactical concept of the course is based on the theory of cooperative learning, following four principles (Renkl, 2007): First individual responsibility of each group member for the group result is necessary, second the learning progress is assured by discussion and solution of differing perspectives, third a higher level can be reached by cooperation than could be reached by students working on their own. Moreover, discussions, mutual explanations and assistance are related to cognitive and metacognitive strategies that help to integrate new information and to supervise learning progress and gaps in knowledge (Hausmann *et al*., 2004). Due to this concept, so-called 'learning communities' (Bielaczyc and Collins, 1999) are established which work together during the lectures as well as when preparing their group presentation mentioned above.

The target group of the course 'sustainability and ethics' are students of all subjects, but especially students of the natural and geo-sciences. In these subjects, sustainability is very often regarded as a mere scientific or technical task, not regarding its implicit normative questions. For them the debate about the ethical aspects of sustainability and the fundamental questions linked to it might broaden and enrich their perspective on sustainability.

Like all the courses developed within the framework of the project 'Accepting Responsibility', the course about sustainability was evaluated by the Centre for Key Qualifications at the University of Freiburg by means of a student survey and additionally by the project team. Success was judged by different criteria, among these for example the performance of the teacher including the activation of students, the learning climate and the (assumed) relevance of the topic for future professional life. From term to term, the course has been steadily modified and adapted to meet the demands of a fast developing subject matter, as well as of its relation to practical experience.

Experiences

Above all it is to be said that all the courses on ethics for bachelor students were attended by very interested students, who participated actively and at a high level. Being aware of the high importance of these topics for solving urgent societal problems, students generally appreciated the courses. This was shown in the evaluation sheet of the student survey as well as in personal talks with the teachers. Students of the course 'sustainability and ethics' even suggested to offer this course to all students, or to integrate it into the compulsory study program.

Students came from a wide range of subjects – for example, among twenty participants, more than ten different study subjects could be counted. The teaching staff reported significant achievements concerning the students' capabilities to identify, communicate and deal with ethical problems. Owing to the diversity of the subject matter of participating students, it ensured lively discussions and moreover the chance to practise interdisciplinary skills, what we consider as 'interface expertise'.

In order for the students to profit from the interdisciplinary seminars, the staff was required to have highly motivated and developed skills in a wide range of ethical applications. This allowed for the application of methods and premises from a variety of subjects and the discussion of highly heterogeneous premises and the bringing together of different scientific cultures.

Follow-up and advancements

Within the framework of the project 'Accepting Responsibility' the topic of responsibility was complemented by courses on the topics 'introduction into ethics', 'ethics and media', 'ethics and information technology', 'ethics and gender mainstreaming', 'ethics and the sciences', 'ethics and economy' and 'ethics and politics'. Our courses in interdisciplinary ethics indeed offered a 'key' to implementing applied ethics in professional practise.

Based on the experiences described above, other modules were developed to be offered at the Faculty of Forest and Environmental Sciences. The module 'Ethics and Sustainability' is part of the module 'Energy and Sustainable Development', a compulsory part of the curriculum of the international master course 'Renewable Energy Management', organised by the Centre for Renewable Energy at the University of Freiburg.

The range of subject matters represented within the course is less broad, the students holding a degree in various engineering branches or environmental studies. However, the students' cultural background is extremely heterogeneous, as they come from all over the world. This offers the possibility to have lively and sometimes quite controversial discussions about important topics like global justice, environmental ethics or responsibility.

Courses were not only very well accepted and evaluated at the University of Freiburg (see above), we also 'exported' topics and teachers to other universities, such as Konstanz, Trossingen and Landau. The project 'Accepting Responsibility' ended by October 2010, but the topic of sustainability and ethics is taught further on. We consider it as a necessary component of academic education, which is worth being complemented by other topics of applied ethics.

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Teaching sustainable development and environmental ethics: the IBMB-concept of bringing theory and practical cases together

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Abstract

University courses often have high academic standards but lack a reference to the 'real world'. Students do not get in contact with practical cases, a fact that needs to be changed, especially when it comes to environmental ethics. Sustainable development and environmental ethics as a university subject give educators the opportunity to sensitize future natural scientists to multi-faceted environmental problems. Teaching sustainable development and environmental ethics is therefore an interdisciplinary challenge that means bringing together philosophical ideas and concrete practical cases, at the local, regional, and global levels. It enables students to appreciate different points of view, to identify conflicts and to develop problem-solving strategies. This is best done with a combination of diverse teaching methods and access to the field of environmental problems. In our curriculum, we use team teaching methods with two members of our institute. We combine this with external expertise: for every session, an expert from a concrete field of application is invited (for example a geologist to talk about renewable resources or a biologist to inform about biodiversity). These experts introduce important sustainability issues to the students in a short talk, after which our teaching team prepares case examples that present problems related to the talk. These cases are then processed by students in small groups over a short time period. It is the students' job to identify ethical issues and to prepare first suggestions of possible solutions. Later, group results are presented to the entire class. After a plenary discussion, results are summarised by the teaching team, contextualised in terms of current scientific discussions, and commented on by the external expert. This teaching concept combines insights of 'real world' problems with interactions with experts, giving students an ethical-philosophical toolkit for their later work. To spread this concept is therefore very important.

Keywords: interdisciplinarity, sustainability, team teaching, external experts

Introduction

University courses often have high academic standards but lack a reference to the 'real world'. Students do not get in contact with practical cases, a fact that needs to be changed, especially when it comes to environmental ethics.

Students taking environmental ethics classes often have a background in natural sciences (e.g. bio sciences, environmental sciences, environmental technology, geology, biology). After finishing their studies, many students will meet situations in their future workplace where planning and decision-making becomes relevant. Finding approaches and solutions with an impact on our surroundings will be a crucial part of their jobs. It is therefore important to prepare students as early as possible in their training to think in more complex ways and consider the potential effects of their decisions.

Sustainable development and environmental ethics as a university subject gives an opportunity to sensitize future natural scientists to multi-faceted environmental problems. Teaching sustainable development and environmental ethics is therefore an interdisciplinary challenge that means bringing together philosophical ideas and concrete practical cases at the local, regional, and global levels. It enables

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students to assume different points of view, to identify conflicts and to develop possible problem-solving strategies. In this way, students learn that ethics is not an old-fashioned sub-discipline of philosophy or theology but rather an approach to deal with everyday issues.

In this paper, we firstly discuss some general ideas about teaching environmental ethics – the understanding of environment, of ethics, and of teaching environmental ethics – secondly present our general approach, and thirdly give a concrete example of a lesson in which we learned about malaria and DDT.

The meaning of environment, ethics, and environmental ethics in teaching environmental ethics

Teaching environmental ethics means first of all to ask students for their own understanding of environment, their own meaning of ethics, and their own perception of environmental ethics. Before we start to talk about concrete case examples, we therefore develop a kind of 'superstructure' for our class:

In the first lessons of an environmental ethics course it is helpful to raise and discuss rather general questions: What is your understanding of environment? What does it include? Persons, animals, plants? Forest decline, water shortage, the greenhouse effect, climate change? Where and what are the borders of your environment? Does it end at the borders of your home town, your county or canton, your country?

In relation to these questions, it is crucial to introduce students to certain concepts or positions in environmental ethics. How and why do people argue in a certain way? Who or what is the centre of their argumentation? Do they follow an anthropocentric perspective, where everything has to serve the purpose of humans? Is a pathocentric perspective used which would mean that living beings able to suffer receive a certain attention? Is everything living and to be protected, including flies or other insects, as found in a biocentric perspective? Or is it everything to be considered equally, including non-living entities like stones, as a holist position would claim? (For further details see for instance Brenner, 2008; Lienemann, 2005; Resnik, 2009) What are the current concepts and conceptions of sustainability? Where does this idea come from? What is the difference between strong and weak sustainability? What is meant by intergenerational justice? Is the interaction of the three pillars – economy, ecology and society – a relevant sustainability-model? (See e.g. Grunwald and Kopfmüller, 2006; Ott and Döring, 2008)

Secondly, questions concerning the understanding of ethics in general need to be raised. What do ethics mean for the students? Who should be involved in ethical decisions? Is it the casual philosopher or theologian? Or should all concerned parties be involved (e.g. when a new train station needs to be built, or when a pesticide shows side effects)? How can an ethical decision be made? Is it necessary to read Kant or other great philosophers? Or is it perhaps much more applied?

In our concept, we aim to sensitize students and make them aware of their responsibilities as well as their potential involvement in certain projects or cases. Our so called superstructure, developed in the first lessons, provides the students with a tool kit containing basic vocabulary to describe environmental ethics, gives a basic understanding of sustainability concepts and a first personal well-grounded perception of environment and environmental ethics.

Additionally, the scheme of Wolfgang Lienemann can be introduced to the class as a useful tool for making ethical decisions (Table 1). Lienemann's scheme of an 'Aufbau und Reflexion einer ethischen Urteilsbildung' (Lienemann, 2005) offers various steps to approach an ethical decision. It starts with the identification of the problem (what is it all about?), analyses the situation (what are the current and situational challenges?), asks for different options, raises normative points of view (what would we like

to do? What could and should we do?), and comes to the question: what should count and who claims it? Finally, Lienemann recommends building a synthesis as well as an adequacy control.

This scheme with its various subsequent questions (see Lienemann, 2005: 12-13) together with our superstructure serves as a useful tool for our students in the following lessons and prepares them for the analysis of case examples.

In our understanding, environmental issues are often characterised by complexity, uncertainty and ambivalence (see Renn, 2009) as well as by a need for the ability to see inter-relations and context (Beecroft and Dusseldorp, 2009). (In this point, the affinity to technology assessment is very close (see for example Skorupinski and Ott, 1998)).

It is our didactic aim to enable students to find their own point of view, to reflect on their positions, and to make their own ethical decisions based on arguments and not on non-reflected emotions. Following Beecroft and Dusseldorp, this can be understood as an educational programme that aims at 'die Mündigkeit der Adressaten in Bezug auf die anliegende Problemlage' (Beecroft and Dusseldorp, 2009).

The IBMB-approach in theory

In our curriculum, we use team teaching methods with two members of our institute. Team teaching is especially useful when different contents have to be presented or study groups need to be overseen. In our environmental ethics courses, this is usually the case.

We combine our teaching team with external expertise: for every session, an expert from a concrete field of application is invited (for example a geologist to talk about renewable resources, or a biologist to inform about biodiversity). These experts introduce important sustainability issues to the students in a short talk. Since we look especially for experts with research knowledge and applied experience, usually concrete case studies can be presented.

In connection to this expert talk, our teaching team prepares case examples, so-called 'vignettes' (concrete example see below) that present related problems. Those cases need to be processed by the students. This is done in small groups over a short time period of approximately 10 to 15 minutes.

In general, this concept can be applied for a class size from 20 to 40 students. For larger groups, some modifications have to be made.

During this time, students must identify ethical issues and prepare first suggestions of possible solutions. Based on the superstructure and scheme for ethical decision-making developed together at the beginning of the course, students thereby learn how to develop different approaches to problem-solving.

During the group work period, the teaching team supervises the problem-solving process. The two lecturers walk around, visit the student groups, answer questions and moderate the group discussions.

At the end of the group-discussion period, group results are presented to the entire class and discussed. Students from other groups can jump in, ask questions, scrutinise the arguments and challenge the presented approaches.

In general, group results differ and the students must explain their decision-making process to one another. This provides thrilling insights into the complexity of decision-making. Students thereby learn

Table 1. Based on Lienemann (2005).

Steps and reflexion of ethical decision-making
1. Identification of the problem
2. Analysis of the situation
3. Analysis of options
4. Normative points of view
5. Obligation
6. Synthesis and suggestion of approach
7. If possible: control of adequacy afterwards

that there is rarely a single 'best' way to make decisions, but that it must involve firstly looking closely at all involved actors and entities and secondly a thorough assessment of the consequences.

After this plenary discussion, the presented group results are summarised by the teaching team, embedded in current scientific discussions, and commented on by the external expert.

The IBMB-approach in practise: malaria and DDT

In order to illustrate our method, we will shortly present a concrete example of a lesson in which we discussed the use of the insecticide DDT (dichlorodiphenyltrichloroethane) to fight malaria.

Background

Malaria is an infectious disease that still causes huge numbers of deaths every year. The WHO states that, worldwide, approximately 350 to 500 million people suffer from acute malaria, resulting in circa 1,000,000 million deaths. Among these are about 3,000 children who die every day (WHO, 2006). Malaria is especially widespread in Sub-Saharan Africa and predominantly affects the poor (WHO, 2010).

DDT is a very well-known insecticide which, in the 1940s and 50s, was used to protect crops and to fight all kinds of vermin, especially so-called vectors (disease carriers) like the anopheles mosquito that carries malaria or the tsetse fly that carries the sleeping disease. DDT was – and still is – very effective by indoor residual spraying (IRS) which is one way to prevent malaria.

In the 1960s, DDT's severe side effects began to be discovered, for example a thinning of bird-egg shells that almost led to the extinction of many birds, and caused endocrinologic disturbances in several reptiles. DDT was also found in breast milk in countries where it was widely used. For this reason, in the early 1970s, DDT was banned in many countries (Böschen, 2000).

Since the ban of DDT, the numbers of malaria infections have increased again. In 2006, the WHO therefore decided to again recommend moderate use of DDT in IRS (WHO, 2006).

The DDT-malaria case shows that 'promoting human health and protecting the environment are important ethical issues that often harmonize but sometimes do not' (Resnik, 2009: 12). It emphasizes the possibility to either focus on health issues or on environmental aspects or on a combination from

both (Resnik, 2012). The students can apply any approach or concept discussed in our first sessions or develop their own.

For our class on this subject, we looked for an external expert who had worked with malaria and DDT, and invited the head of vector control of the Swiss Tropical Institute, who had done extensive research on malaria and DDT.

The lesson started with the teaching team presenting some general information about Malaria and DDT and a review of ethical decision-making.Team teaching offers the possibility to share the presentation, with one person presenting the ethical aspects and the other giving general information.

Next, the external expert presented his research results and shared experiences from his work. The students had already prepared background reading for the class and so had received enough additional information to work on the vignettes, our prepared case examples. In small working groups, students then discussed two case vignettes:

The first vignette concerned the discussions in the WHO in 2006. At this time, the WHO was fully aware of the negative side effects of DDT but also of the increasing numbers of malaria infections and deaths. Based on this background information, students discussed an approach to solve the dilemma.

The second vignette presented the case of a small fishery cooperative at the shore of Lake Victoria. This small cooperative was on the one hand affected by Malaria cases. On the other hand, the fishermen could no longer sell their fish to the US and Europe because their fish contained too much DDT.

The group discussion was followed by a vivid plenary discussion and a short presentation of alternative methods to the use of DDT.

Conclusions

This teaching concept combines insight into 'real world' problems, interaction with experts, and an ethical-philosophical toolkit for the later work of the students. Students are enabled to develop a sense of the importance of ethics in everyday life, to learn that simple answers to ethical dilemmas seldom exist, and are made aware of the necessity of assessing effects.

The primary goal of our concept is that students learn about their responsibility as practitioners, and that they need to reflect on the consequences of their decisions. Team teaching is an important tool in this concept. It facilitates reaching our goal and also provides a means for keeping students interested and animated.

In our opinion, it is important to spread this teaching concept because it is an important contribution towards educating students to become responsible researchers and employees.

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Section 19. Ethical matrix and learning instruments

The Mepham Matrix and the importance of institutions in food and agricultural ethics

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Abstract

This contribution aims to point out first, that the issues of employing genetically modified plants in agriculture and green consumerism demonstrate the importance of institutional aspects for ethical deliberation about issues of food production and consumption, second, that this points to the necessity of scrutinizing the respective perception of the situation, and third, that complementing the Mepham-Matrix with a matrix that allows depicting and scrutinizing the perception of the case in question constitutes a promising way of meeting this challenge.

Keywords: genetically modified plants, green consumerism, ethical decision making

Introduction

Mepham originally developed the ethical matrix in his work on biotechnology in food and agriculture. In this field, many political decisions were and are based on scientific expertise but met with considerable resistance from the general public. Mepham assumes that scientific evaluation may not be sufficient to reason a policy that is acceptable for the general public. He conceives the matrix as a tool for making ethically acceptable public policy decisions. Drawing on early Rawlsian work, he asks for principles implied in common sense morality. His matrix draws on the approach Beauchamp und Childress developed for medical ethics. They argue that decision-makers in this field should *prima facie* take into account the following four principles: non-maleficience, beneficience, autonomy and justice. Mepham adapts this concept for agricultural and food ethics. To this end, he combines the principles of non-maleficience and beneficience. He then relates the resulting three principles with four different interest groups. (Mepham, 1996, 2000) This yields a matrix as given in Table 1.

Mepham argues that this matrix allows presenting the ethically relevant aspects of any agricultural production system from the perspective of the different affected parties. In this contribution, it is asked in how far the Matrix lacks comprehensiveness in that it does not (sufficiently) allow addressing the institutional framework (legal and economic rules, conventional and societal values, etc.) in which cases

Table 1. The ethical matrix (adapted from Mepham, 2000: 170).

Respect for	Well-being	Autonomy	Justice
Treated organism			
Producers (eg. farmers)			
Consumers			
Biota			

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take place. To this end, the first part of the paper discusses two cases along the lines of the ethical matrix: Employing genetically modified plants (GMPs) in agriculture and green consumerism. This discussion aims first to show that the matrix allows systematically addressing many important issues. Second, it aims to identify a shortfall, namely, that the matrix is not adequately equipped to call attention to institutional issues. The second part of the paper than relates the ethical matrix to a model of ethical decision making as proposed by Dietrich. Drawing on Dietrich, I point to the importance of perceiving and describing a situation or case in ethical decision making. Hence, I propose to complement Mepham's evaluational matrix with a perceptional matrix.

Employing GMPs in agriculture

For the aim of this paper (see above) it suffices to confine the analysis to an anthropocentric position. Regarding the *well-being* of farmers, it is likely that – as with any new technology – early adopters will benefit while others, especially farmers in less developed countries will lose out in competition and thus suffer income loss. (cf. Mepham, 1996) Regarding consumers, first generation GMPs that aim at advancing traits in regard to the production of plants will not benefit consumers. Second generation GMPs featuring nutritious benefits, better flavor or a longer shelf life might benefit consumers.

Regarding the *justice*-column, there is an interesting debate about either farmers growing GMPs harming GMP-free farmers by exposing them to GMP pollen or GMP-free farmers harming prospective GMP-growers by insisting on strict regulation of GMPs, thus making growing GMOs more difficult and less financially attractive. An analogous debate relates to either consumers asking for GMP-free food harming those who would prefer GMP-food (either because it is anticipated to be cheaper in the long run or because of expected benefits of second generation GMPs for consumers) or vice versa.

Regarding consumer *autonomy* it is argued that if introducing GMPs does not make GMP-free food production impossible, consumer's freedom of choice to avoid GMP-products can be guaranteed by labeling either GMP- or GMP-free products. If introducing GMPs is expected to make GMP-free food production impossible, either the autonomy of those consumers asking for GMP-free food or of those asking for GMP-food will be harmed. Finally, regarding producer's autonomy, if introducing GMPs does not make GMP-free production impossible, regulation could ensure co-existence of both forms of farming. Again, if introducing GMPs is expected to make GMP-free farming impossible, either the autonomy of farmers aiming at GMP-free production or of those wanting to employ GMPs will be harmed. The given evaluation is summarized in Table 2.

Table 2. Evaluation of employing GMPs in agriculture regarding producers and consumers.

Respect for	Well-being	Autonomy		Justice
Producers (e.g. farmers)	Early adopters will benefit while others will suffer loss of income	If coexistence is possible Regulation can ensure co-existence	If coexistence is impossible One group will be harmed	One group will be harmed but it is unclear who qualifies as polluter and victim respectively
Consumers	Possible regarding second generation GMOs	Consumer choice can be respected by labeling		

One important argument against the employment of genetically modified plants points out that transnational enterprises (TNEs) use GMPs to enhance their oligopolistic position by employing GMPs and accompanying patents to commercialize seed production and by advancing combinations of GMPs and specifically adapted pesticides to further their vertical market integration. I here propose that the ethical matrix is not adequately able to capture this issue. It could be subsumed under the notion of autonomy of both producers and consumers, that is, by arguing that the furthering of vertical market integration of TNEs threatens both farmer's autonomy to choose how they want to do agriculture as well as consumer's autonomy of choice regarding food consumption. However, the issue I would like to point out is that the fact that current development of GMPs focuses on combinations of GMPs and specifically adapted pesticides inter alia results from an institutional framework that favors capital-, energy- and input-intensive agriculture to the disadvantage of low-input, locally adapted and generally more sustainable agriculture. This than explains why currently, GMPs are primarily advocated by TNEs.

Green consumerism

First, agriculture and food production cover about a third of the world's terrestrial surface (Smith *et al*., 2010), causing about 20% of global anthropogenic GHG-production (including land use change, cf. Foresight, 2011; Smith *et al*., 2007) and is related to soil degradation, pollution of water bodies with nitrogen, phosphorus and pesticides, and biodiversity loss. (FAO, 2006) Furthermore, working conditions in agriculture in developing countries are often quite bad. Second, food production is instrumentally geared towards food consumption. Finally, different types of diet can be ranked according to their environmental and social impact. By way of example, it can be demonstrated that a diet featuring a low share of animal products (i.e. meat, dairy, eggs) in overall food consumption has a much lower environmental impact than a diet characterized by a high share of animal products. (Von Witzke *et al*., 2011) Buying fair trade goods may contribute to bettering the livelihood of farmers and agricultural workers in the global south.

In so far as claims for intra- and intergenerational justice necessitate unexploitative relationships with producers in developing countries as well as maintaining a livable natural environment for future generations, taking up a socially and environmentally 'friendly' or sound or diet can be conceived of as reasoned by claims for justice. (cf. Voget-Kleschin, 2012)

In the context of this contribution, I will understand sustainable food consumption as aiming for such a socially and environmentally 'friendly' diet. This includes first, substituting conventionally produced products with products whose production is characterized as environmentally friendly and socially acceptable, as well as respecting claims for animal welfare. I will understand products stemming from organic agriculture, seasonal products with high value added for local producers and fair trade products as an adequate proxy. Second, green consumerism does also necessitate changing the composition of one's diet. Thus a low share of animal products and a certain share of regional and seasonal products can also be seen as constitutive aspects of green consumerism. (*ibid*.) Accordingly, sustainable food consumption does necessitate to shop and cook differently. Hence, sustainable food consumption does not only require that consumers invest more money for more expensive sustainably produced products but also more time and knowledge – and it requires that consumers are prepared to question and change food consumption habits (*ibid*.).

How can the effects of sustainable food consumption thus conceived be depicted by the ethical matrix? I propose that effects for the *treated organism*, especially farm animals, are overall positive because by definition sustainable food consumption takes animal welfare into account. Furthermore, I propose that a similar argument holds for effects regarding *biota*, because again, by definition, sustainable food consumption draws on 'environmentally friendly' products. Regarding *producers*, I propose that effects

on well-being as well as an evaluation regarding justice issues are probably positive because producers will be able to achieve higher prices. Respect for their autonomy however might be constrained because the idea behind green consumerism is that consumers choice 'dictates' what kind of production methods producers can use if they want to successfully market their products. However, the same holds for the current situation and there is evidence that producers would prefer producing according to more sustainable methods if they could handle down price increases to consumers. However, I hold that the really interesting row is the one referring to *consumers*: Evaluation of green consumerism in regard to autonomy is straight forwardly positive. This is so, because expecting consumers to buy according to their ideas of what constitutes a sustainable, environmentally and socially acceptable way of producing food is very much based on an ideal of consumer autonomy. However, as discussed above, sustainable food consumption will probably be associated with higher demands regarding money, time and knowledge. As most consumers do not (feel they have) idle time or money at their disposal, if they invest more time and money into food, it will be lacking somewhere else. Accordingly, the individual demands for sustainable food consumption might be experienced as stressful. In terms of justice, it can be argued that the individualization of responsibility for sustainable food consumption overburdens the individual. (cf. Middlemiss, 2010) The given evaluation is summarized in Table 3.

The point I would like to stress here is that the extent to which green consumerism is experienced as difficult, stressful and thus overdemanding very much depends on the institutional circumstances in which such consumption decisions are taken. This is an aspect which is generally recognized in the literature regarding sustainable consumption. (cf. (Southerton *et al*., 2004) In regard to food consumption, it is possible to argue that the question if and to what degree consumers are able to invest more time and money into sustainable food consumption depends on their income, on how long they have to work and at which times, that is, with working conditions, available child care and care for the elderly, with structures of recognition for such work as cooking and housework, etc. (cf. Voget-Kleschin, 2012) Accordingly, the extent to which individual people can bear responsibility for the environmental and social consequences of their food consumption habits depends on social, legal and economic circumstances. (cf. Middlemiss, 2010) Again these are issues which do not readily fit into the structures of the ethical matrix.

Table 3. Evaluation of green consumerism based on the ethical matrix.

Respect for	Well-being	Autonomy	Justice
Treated organism	Positive because of respect for claims for animal welfare		
Producers (eg. farmers)	Positive because of higher prices	Constrained by conscious consumer choice	Positive because of higher prices
Consumers	Context-dependent: higher prices and higher time needs might be conceived of as stressful, other tastes might be conceived of as positive or negative	Positive because green consumerism adheres to the ideal of consumer autonomy	Overburdening of individuals possible
Biota	Positive because production methods are environmentally friendly		

Discussion

The ethical matrix constitutes a conceptual tool for ethically sound and acceptable decision making. In the following I will draw on a model of ethical decision making ('ethisches Urteilsbildungsmodell') as developed by Dietrich to explore the implications of the fact that the Mepham-matrix is not adequately equipped to call attention to institutional issues.

Dietrich (2009) grounds her model of ethical decision making in the Practical Syllogism and distinguishes four elements of ethical decision making, namely perception ('Wahrnehmung'), evaluation ('Bewertung'), judging ('Urteilen') and acting ('Handlung'). In this context, I would like to highlight two aspects: First, Dietrich points out that ethical decision making is not only about reviewing and reasoning norms and values, but also about reviewing and reasoning empirical information. Second, and related to this, Dietrich conceives of perception and evaluation as interrelated: 'A fact or a situation is perceived as ethically relevant before the background of certain norms or values; norms or values are perceived as pertinent because a certain fact or situation is taken as given.' (*ibid*. 230-231, translation: LVK)

In relating the different interest groups to the three ethical principles, the ethical matrix both structures and initiates such an interplay between facts and values. However, I hold that it does not sufficiently allow scrutinizing the facts, that is, the description of a case or situation. Rather, it takes certain aspects of the situation as given. As discussed in the case studies, this inter alia refers to the institutional frame, that is, the social, legal and economic circumstances.

In a course on food ethics developed and conducted in cooperation with Hohenheim University (cf. the contribution of Julia Dietrich *et al*., 2012), Julia Dietrich and myself employed two matrices: One matrix relates to the evaluation and basically corresponds to the Mepham-Matrix as introduced above. Additionally, we introduced a second matrix that relates to perception and has a special focus on structures (cf. Table 4).

The point I would like to emphasize is not that the perceptional matrix as such is complete. Rather, in the course we used an even more extensive matrix. What I would like to pose for discussion is that by filling in *both* matrices, participants are encouraged to review and reason norms and values, but also to review and reason empirical information. Inter alia, this allows questioning if and in how far certain

Table 4. A proposal for a complementary perceptional matrix.

		Does the case in question explicitly relate to structures/ institutions? Which structures/ institutions are important?				
Who participates? (And who could or should participate?)		Disciplines	Hierarchies	Financial power	Esteem	Other
Subjects of ethical deliberation	Consumer					
	Producer					
	TNEs					
	Other					
Objects of ethical deliberation	Treated organism					
	Environment (instead of: biota)					
	People involved / affected					
	Other					

institutional frameworks need to be taken as given or if and in how far they can and should be changed and how this bears on the ethical evaluation. As I hold that ethical issues in food and agriculture are very much influenced by social values, legal norms and economic structures, I take this to be a fruitful and necessary addition, especially in regard to food and agricultural ethics.

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The ethical matrix as an instrument for teaching and evaluation

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Abstract

This contribution presents how the Ethical Matrix was used in teaching and evaluating a course on 'Ethics of Food and Nutrition Security' (EFNS) at Hohenheim University in the winter semester 2010/2011 and in the winter semester 2011/12. We will first provide some information on the development of the course and present the results of the general evaluation of the course by the department. We will then introduce the newly developed instrument in which the Ethical Matrix was embedded. The instrument aims at testing individual skills necessary for identifying ethical issues. Finally, we will draw some conclusions that refer to the further development of the instrument.

Keywords: ethical skills, educational research

The development of the course 'Ethics of Food and Nutrition Security' (EFNS)

The general policy and academic discourse on the world's food system has mainly focused on food security and clinical nutrition. With the emergence of the concept of food sovereignty in the 1990s, i.e. autonomy, justice, and well-being with regard to food and nutrition security at the individual and local level, these approaches need to be reviewed critically. Food sovereignty implies an ethical claim for political, economic, and social responsibility, generational justice, human rights, and precautionary action. Arguably, food sovereignty is the core principle in achieving food and nutrition security. The ethical nature of food sovereignty claims requires a logical analysis rarely addressed in agricultural studies. Therefore the agricultural sciences must broaden their focus and embrace an interdisciplinary approach, including the field of ethics, in order to prepare new students, as well as mature scientists, to ask and engage in scientific inquiry that is both relevant and ethical.

To this end, the student group Food Revitalisation and Eco-Gastronomic Society of Hohenheim (FRESH) at the University of Hohenheim (UHOH) held a day-long conference in November 2008 entitled 'The IAASTD and the Transformation of Agricultural Research Education'. One outcome of the conference was a clear call for the introduction of applied ethical training within agricultural studies in order to facilitate the inclusion of social and ethical questioning in research and teaching. This identified need served as the foundation of a new module that started in winter semester 2010-2011 called 'Ethics of Food and Nutrition Security (EFNS)'. By the summer of 2010 and with permission from the UHOH Faculty of Agriculture, the first year of instruction was being finalized by FRESH in collaboration with the Chair of Gender and Nutrition (UHOH Faculty of Agriculture), and the International Center for Ethics in the Sciences and Humanities (IZEW), University of Tübingen.

The new EFNS module is divided into two thematic parts. One part introduces concepts and basic knowledge on ethics and moral philosophy, as well as their application in food and nutrition security. The aim is to help students make use of analytical tools for discussing, asking and arguing ethically and to try to connect their acquired knowledge in agriculture and nutrition to the field of ethics. The key aspect is the discussion of basic concepts of ethical argumentation (Dietrich, 2008) and the Ethical Matrix proposed by Mepham (Mepham, 1996, 2000, 2006) to develop ethical questions related to nutritional

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and agricultural science and inquiry. The course on the fundamentals of ethics in the first part of the module consisted of 14 double periods, each of which was 45 minutes long. The second thematic part concerns the introduction of ethically problematic issues in food and nutrition security, with emphasis placed on applying ethical analysis to these problematic subjects. Thus, not only knowledge about topics and problems of food and nutrition security are communicated, but students also acquire the skills to recognize ethical challenges and to critically and independently analyse the same. Self-reflection is promoted to effectively perceive the social responsibility of young scientists to discuss and participate in the future of global food systems.

Evaluation

The first round of the module (winter semester 2010-2011) was evaluated with interactive feedback and a specially developed survey as well as the standard UHOH course evaluation. First of all, the students stated that they wanted more basic theoretical lectures on philosophy and ethics. Various options for the course improvement were discussed, among them were the ideas that: a) the existing module could place greater emphasis on philosophy and ethics over the course of the semester; or b) follow-up classwork could be undertaken at the University of Tübingen. Secondly, students needed a more systematic approach in order to connect more successfully the acquired tools of applied ethics to the second part of the course on current topics. Besides getting structural and didactical criticism for course improvement, the evaluation survey asked students to self-evaluate whether they believed they had increased their competence of ethical perception. Students used a range from one to five to indicate whether they totally agreed (1) or disagreed (5) with the questions as mentioned in Table 1.

Overall, students taking EFNS in its first year reported a sense of improved ethical competence (see Table 1), but there is clearly much room for improvement, especially in the application of an ethical dimension to immediate contemporary conflicts and dilemmas in the context of agricultural sciences in general and students' own particular role in related research. At the end of winter semester 2011/2012 a second feedback round will be conducted.

Using the ethical matrix as an instrument for evaluation

Collaterally to the course, the Institute for Social Sciences in Agriculture (Chair in Gender and Nutrition), University of Hohenheim, and the International Centre for Ethics in the Sciences and Humanities (IZEW), University of Tübingen, carried out a small scale research project to analyse if the teaching of ethical theory and the use of tools, e.g. the Ethical Matrix, enhances ethical sensibility and the skills to identify ethical issues in an explicit and complex manner (Lutz *et al*., 2011). For this

Table 1. Selected results of the course evaluation; number of students: n=18.

Question	Arithmetical mean (1: fully agree, 5: fully disagree)
1. Do you feel more capable of seeing, articulating and analyzing ethical dimensions of issues of food and nutrition?	2.21
2. Do you feel more capable of relating your studies to the ethical questions they pose?	1.93
3. Do you feel more capable of solving real-life ethical dilemmas/of identifying hidden ethical aspects?	2.43

purpose an instrument was developed that is composed of two components: a) a text that needs to be analyzed and a series of questions associated with the text as a media for collecting data and b) a matrix, which is the tool used for evaluating the responses. The students (n=17) received information on the procedure, goals and relevancy of the study, and the researchers received their informed consents for their participation in the study. Testing was conducted at three different times: at the beginning, after the unit on basic ethical education, and at the end of the module. The students were given newspaper articles approximately a page and a half long and were asked what ethical issues they associate with the text (Processing time: 60 min). Since the teaching unit aimed primarily at the mediation of perceptual skills in everyday professional (and private) practice of students, three English newspaper articles of The Guardian were selected, each of which focused heavily on one particular dimension of the topic (e.g. critical reasoning, presentation of facts, individual or social-ethical dimensions). In dealing with the texts, the students' skills should show themselves in their ability to grasp the one-sided focusing and tap into the other dimensions of each case. The students' answers were evaluated with a matrix, which combined the techniques of content analysis with quantitative methods.

The design of the instrument was newly developed, for the existing approaches from German research do not focus heavily enough on the role of ethical theory in teaching and learning interventions (e.g. Fuchs, 2010; Reitschert, 2009; Rösch, 2009). The fact that the current state of research as a whole is insufficient and the research presented here is urgently needed is reflected in the fact that a standard work on competency assessment (Erpenbeck and Rosenstiel, 2007) makes no mention of the measurement of ethical skills in the stricter sense of the word, i.e. the theory-based ability to reflect on moral issues. The theoretical foundation of the new instrument combines Dietrich's model of ethical judgments, Mepham's approach to nutrition and agricultural development issues and Bybee's approach to assessing scientific literacy.

Dietrich's model of ethical judgment implies that ethical literacy is composed of four basic competencies, namely perception, evaluation, judgments and actions (Dietrich, 2007). The distinction of these skills is not empirically established but theoretically based on an interpretation of the Aristotelian practical syllogism as a linguistically flexible and fairly neutral structure of argumentation that can be extended to include critical reflection (Dietrich, 2009). The model emphasizes the importance of ethical perception and the interaction of ethical perception and evaluation: Data gain their ethical relevance only against the background of norms and values being deemed appropriate, which assume not only a justifying function but also an orientating function. Mepham's ethical matrix (Mepham 1996, 2000, 2006) can easily be related to this idea, for it teams data on the stakeholders involved with three principles, the respect for wellbeing, autonomy and justice (Mepham, 1996: 106, 2000: 168). As the matrix is lacking perspectives of institutional issues and of ethics of good life (see the article by Voget-Kleschin in this volume) appropriate additions were made for its use as a part of the evaluation instrument. In addition to developing categories for ethical issues as such, it was also necessary to discern different levels of the students' skills to recognize these issues. Rodger Bybee developed a four-stage theory of scientific literacy for the natural sciences in order to describe different approaches to scientific terminology: The nominal level focuses on the correct identification of terms and issues but also demonstrates a misunderstanding of the same; the functional level, however, refers to the proper understanding or use, whereas the conceptual and procedural level addresses the understanding of concepts and relationship of terms, ultimately leading to a multidimensional level that takes on a meta-perspective and places a variety of approaches and disciplines in one (correct) relationship (Bybee, 1997, 2002). As Bybee does not take into account that basic skills do not necessarily need to be conscious as such, but can also be implicit, Bybee's four stages were therefore 'doubled' and expanded to include four preliminary implicit stages. Whether this order, which ultimately reflects normative ideas concerning the goals of teaching and learning processes, is didactically and empirically sound and desirable, will need to be discussed further. Currently, there is a linear grading from stage I to VIII. The grading table is shown below (see Table 2).

Table 2. Table of gradation.

Nr.	Term	Description
0.	Base line (0)	- No evaluative expressions or ethically relevant content is mentioned, neither implicitly nor explicitly
1.	Nominally implicit (Ni)	- Use of evaluative expressions and facts that can be ethically relevant, but are inappropriate for the situation
2.	Functionally implicit (Fi)	- Accurate and proper identification / articulation of ethical and evaluative issues - No ethical vocabulary
3.	Conceptively/procedurally implicit (Cpi)	- Connection/transfer of ethically evaluative terms within concepts and knowledge of how to establish a connection (interrelation) - No ethical vocabulary
4.	Multidimensionally implicit (Mi)	- (Implicit) assessment of relationships with other concepts or skills
5.	Nominally explicit (NE)	- Use of ethical concepts / evaluative expressions and facts that might be ethically relevant, but are inappropriate for the situation
6.	Functionally explicit (Fe)	- Conceptually and factually adequate identification and application of ethical concepts
7.	Conceptively/procedurally explicit (Cpe)	- Connection/transfer of ethically evaluative terms within concepts
8.	Multidimensionally explicit (Me)	- Conceptual assessment of the relationship to other concepts or skills; frame switch

In summary, a matrix was created for the analysis of the students' responses that combines the techniques of content analysis with quantitative methods (Table 3). It is structured as follows: The subjects of acts (consumer (C), producer (P), researcher (R) and institution as subject (I_S)), the objects of acts (treated organism (TO), environment (E), Persons Involved (PI), an institution as an object (I_O)) and the structure of acts (what or what action (What), alternative (Alt), past (Past), present (Pres) and future (Fut)) form the basic structure, which was complemented by the relevant norms and values, namely such as well-being (W), autonomy (A) and justice (J) and hedonistic (HED) and eudemonistic (EUD) perspectives. Observations that did not fit into the other categories but still display aspects of rights and duties (x(D)) or questions of good life (x(St)) were placed in a residual category (X). Furthermore, the distinction of the amount and level of mentions is also important since the research theses refer to both. In each box, a number from one to eight was recorded along the gradation, indicating the level of perception.

Using this matrix, we evaluated a sample of five out of 17 responses. The samples were not supposed to be representative of all the responses but instead should represent a broad spectrum of the group (e.g. different cultural backgrounds, men/women, different proficiency levels in the previous modules). The following hypotheses were made: we expected that after the first intervention (1) the students would be able to recognize more ethically relevant aspects; (2) name more precisely what they perceived using ethical terminology, and that the description of what was perceived would be more explicit. With regard to the thesis two and three, we observed a higher gradation of the ethical aspects after the intervention. The answers were more accurate and corresponded with ethical concepts. The first hypothesis was not confirmed. There were, however, considerably more abstract concepts (humanity, culture, etc.) that do not appear in the matrix as such, as well as an increased number of meta-discourses. The results are shown in Figure 1 in which the respective number of the ethical aspects and the height of their gradation are listed. The height results from the average sum of the gradated ethical aspects.

Table 3. Matrix of evaluation.

		Perception								
		Rights and duties				Good life				Participant
		WB	A	J	x (D)	HED	EUD	x(St)	X	
Subjects	C									Date:
	P									
	R									Sum:
	I_s									Amount:
Objects	TO									Level:
	E									
	PI									
	I_o									
Acts	Was									
	Alt									
	Past									
	Pres									
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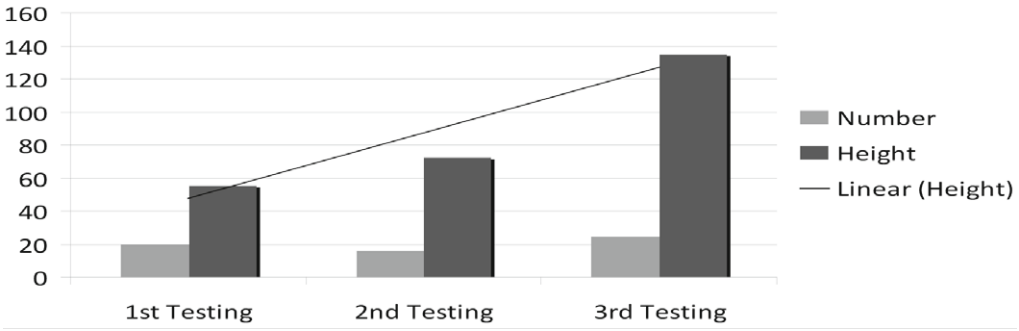

Figure 1. Results of the pilot study based on the three testings before (1st), after the ethics sessions (2nd) and after the whole course (3rd).

In addition to gradation, the following observations can be made: there is a clear dominance of responses from the area of rights and duties, although the perspective of good life is certainly present, which speaks for the expansion of the theoretical basis to include aspects of good life. Researchers are hardly mentioned in an ethically relevant context. Between the first, second and third testing, there is not only an increase in explicitness and complexity but also in the overall use of ethical norms in general. Moreover, the students put in significantly more effort to justify their positions. However, the role of justification within the present model, which could not be determined due to the focus on perception, is still an open question. It is also interesting that different methods of text analysis were applied, which certainly had an effect on the results.

Conclusion

This study is the first to produce preliminary empirical data with the instrument, which for this reason does not completely fulfill the classic criteria like reliability, validity and objectivity. The number of study participants (n=5) was very small, the results could not be compared with a comparison group, and no other study has developed a model for the (empirical) analysis of ethical competence to date. Therefore the results of this pilot study need to be expanded and they support the need for further research in teaching ethics. The task of future research is to confront the limits mentioned in this article by increasing the number of evaluated text responses as well as the number of evaluators (inter-rater reliability) in order to increase the overall reliability of the respective study as well as to probe its framework assumptions. Furthermore, it may, for example, be necessary to develop an ideal reference evaluation for each intervention text to deal with response tendencies. It may also be advantageous to add further perspectives to expand the structures (e.g. legality or intrinsic and extrinsic motivation). Finally, a theory-based expansion of the model to include the aspect of evaluation has yet to be made. Nevertheless the instrument demonstrates at least four positive outcomes that speak for its further development: (1) the strictly theory-based development (focus on ethical theory); (2) the empirical survey of a partial competence of complex set of ethical skills; (3) the differentiated (also theory-based) gradation; and (4) the potential, contextual transferability of the instrument.

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Food ethics for an active citizenry: AgroFood Democracy – an active learning tool

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Abstract

Science and technology students understand well the scientific approaches behind GM crops and the arguments for using them in cultivation and food applications. Even the basics of the authorization processes are quite understandable for them. But, how can we introduce them to the controversial issues regarding the AgroFood Biotechnologies? Why and how far are the principles of organic farming not compatible with those of agro-biotechnology? Why and how far are the principles of the organic farming not compatible with those of agro-biotechnology? Why are some products perceived negatively by consumers? Why do some regions declare themselves as 'GM-free' zones? Why do producers have to advertise in the label that a product contains something that, in turn, could be ethically or religiously objectionable for some people? Is GM food a new kind of pressure against empowered countries? Who and how makes all the decisions regarding the Agro-biotech products in Europe? The aim of this presentation is to explain the background and approach of the *AgroFood Democracy Project*, the multidisciplinary team of which is made of 20 people from 10 Faculties in Spain, the United Kingdom and the USA. The methodology and the tools developed will be described, as well as the reflections on the results obtained from their actual use in a class setting in several Faculties. The basis of the AgroFood Democracy Project is an Active Learning tool. Using a Problem Based Approach, students are given the opportunity to develop critical thinking skills regarding the ethical, political, social and legal aspects involved in the agro-food biotechnologies.

Keywords: agrofood democracy, role-playing games to teach food ethics, teaching innovation, EHEA adaptation

A problem based learning approach to teach food ethics

The process of adapting Undergraduate and Post-Graduate Degree Programs to the European Higher Education Area (EHEA) has changed the concept of student, so that they are now active participants in the teaching-learning process. That implies changing the design of course programs, as well as teaching

methodologies. In the case of food ethics applied to agro-biotechnological developments we have considered that a Problem Based Approach will be useful, because it will make students immerse themselves into the debate. In addition to the factual information about various aspects of agro-biotechnology, we want them to understand the different opinions, the root (not only the leaves or secondary branches) of the conflict that opposes organic farming and defendants of genetically modified (GM) crops and the difficulty to find solutions that are equitable for all.

Science and technology students understand well the scientific approaches behind GM crops, the arguments for using them in cultivation and food applications, and even the basics of the authorization processes. But, how can we introduce them to the controversial issues regarding the AgroFood Biotechnologies? Why and how far are the principles of organic farming not compatible with those of agro-biotechnology? Why are some products perceived negatively by consumers? Why do some regions declare themselves as 'GM-free' zones? Why do producers have to advertise in the label that a product contains something that, in turn, could be ethically or religiously objectionable for some people? Is GM food a new kind of pressure against developing countries? Who makes all the decisions regarding the Agro-biotech products in Europe? How are these decisions made? The aim of this presentation is to explain the background and approach of the *AgroFood Democracy Project*, the multidisciplinary team of which is made of 20 people from 10 Faculties in Spain, United Kingdom and the USA.

The AgroFood Democracy Project has developed a Role-Playing game to be played in courses having 10 or more students. Each role will be developed by one or several students. Initially, it will be implemented in the following courses (8 playing groups in total), in the second semester of 2012: (1) Law and Ethics in the Biosciences (Undergraduate Degrees in Biology, Biotechnology, and Biochemistry); (2) Transgenic Foods (Master in Food Quality and Safety); (3) Transgenic Foods (Master in Nutrition and Health); (4) Social and Legal Aspects of Biotechnology (Undergraduate degree in Biotechnology); (5) Molecular Biology, Undegraduate Degree in Biology, University of Sevilla.

The principles followed during the design and use of the tool are: coherence (all the participating elements help the learning process); construction (students are constructing their own learning process); motivation (keeping the interest and answering questions is the duty of the tutors). Students will be presented with the following situation: the European Commission has gathered a diverse group of stakeholders to express their opinion about the future of GM maize in Europe: consumers and farmers of widely different opinions, scientists, NGOs, biotechnology companies, etc. To answer the question, each role will have to examine the past and present of these crops, advantages and disadvantages, and present its reasoned proposal. After presenting all proposals, the group will analyse and debate them. Finally, each role will present a second proposal attempting to take into consideration the interests of the largest number possible of stakeholders, so that the 'committee' may reach a consensus.

Once the role-playing game is finished, students will be given a thorough explanation of how this type of decisions are made in the EU, so that they may compare it with what they have just gone through. Afterwards, tutors will provide students with several questions to help them reflect on the complex relationship among agro-food biotechnologies, politics and society. Each individual student will submit a written personal appreciation.

Students will receive basic scientific, legal and ethical information prepared by the project team as objectively as possible, as well as the profile of each role. Students are free to seek other information pertaining to their role that they consider important. They are encouraged to examine it critically, making sure that they information they present is based on reliable data and not on unfounded opinions and to contact their tutors for any help they may need. In addition, students may contact actual stakeholders if

they wish to obtain more information. The autonomy of students to build their own rational opinion about all the issues implied in the debate is guaranteed.

The game will allow students to develop abilities and attitudes difficult to gain by other methodologies, such as critical thinking, listening to different opinions, taking into consideration various different interests particularly those of the least powerful and most vulnerable groups, and decision making strategies in plural contexts.

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