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Úrsula Oswald Spring
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Keith G. Tidball
Editors

Expanding Peace Ecology: Peace, Security, Sustainability, Equity and Gender

Perspectives of IPRA's Ecology and Peace Commission

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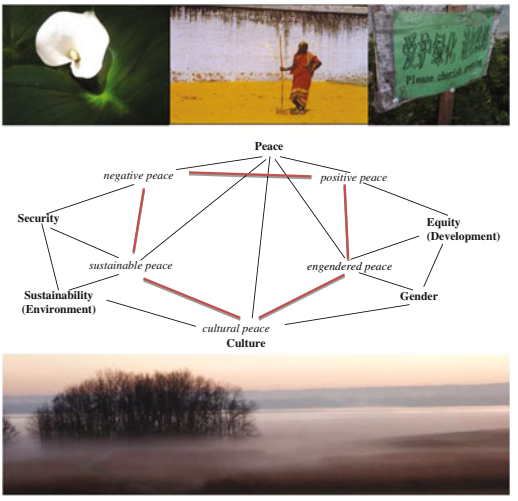

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Contents

Chapter 1
Expanding Peace Ecology: Peace, Security, Sustainability, Equity, and Gender

Úrsula Oswald Spring, Hans Günter Brauch and Keith G. Tidball

Abstract This introductory chapter reviews the conceptualization of peace and ecology and the efforts in the scientific literature to link both areas. The authors expand upon the conceptualization of peace since the 1980s and the widening of the ecology concept from the natural to the social sciences, and then discuss linkages between peace and different ecological approaches of deep, human, social, geographic and political geoecology and ecofeminism. They then contextualize from a peace research perspective the expansion of the ecology concept to a 'political geoecology' and a 'civic ecology', linking security, equity, sustainability, gender and peace. They conclude with an overview of the subsequent eight chapters in this volume.

Keywords Ecology · Environmental peacemaking · Environmental studies · Environmental security · Gender · Peace · Peace ecology · Peace research · Sustainability · Sustainable peace

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1.1 Introduction

'Peace ecology' is an emerging scientific concept that was influenced by the scientific discourse on environmental security and environmental peace making. With this introduction, the three co-chairs of the *Ecology and Peace Commission* (EPC) of the *International Peace Research Association* (IPRA) introduce this concept as a framework for the study of environmental and ecological problems from a peace research perspective. This introduction is divided into four thematic sections and a summary of the chapters of this book that emerged from presentations at the 24th IPRA conference in Tsu City in Japan in November 2012. All chapters were anonymously peer reviewed and subsequently thoroughly revised.

The first section reviews the conceptualization of peace and ecology and the efforts in the scientific literature to link both areas from the perspective of two parallel research programmes of 'peace research' or 'peace studies' and 'environmental research' or 'ecology' (Sect. 1.2). The second section introduces the expanding conceptualization of peace since the 1980s and the widening of the ecology concept from the natural to the social sciences (Sect. 1.3). The third section discusses linkages between peace and different ecological approaches of deep, human, social, geographic and political geoecology and ecofeminism (Sect. 1.4). The fourth section contextualizes from a peace research perspective the expansion of the ecology concept to a 'political geoecology' linking security, equity, sustainability and peace (Sect. 1.5). The final section offers an overview of the subsequent nine chapters in this volume (Sect. 1.6).

1.2 Conceptualization of Peace and Ecology

As any basic concept in the social sciences the concepts of peace, the environment and ecology are "highly contested" (Gallie 1955–1956) and rely on different normative, political, cultural and religious assumptions, values and contexts. Therefore a brief conceptualization and conceptual contextualization of both components of 'peace ecology' is needed.

1.2.1 Peace

Peace and war constitute an opposite status in human history and experienced substantial changes in different cultural and geographical contexts.[1] Peace has different meanings, but globally it is understood as a state of tranquillity, quietness,

[1] This section builds on previous publications by Brauch (2008a) and Oswald Spring (2008, 2008a).

and freedom from any disturbance, oppressive thoughts or emotions. Peace stands also for harmony in interpersonal relations based on mutual agreements among the people involved. The term 'peace' (in French 'paix'; Italian: pace; Spanish: 'paz'; German 'Frieden') originates from the Latin 'pax' and is associated in English with: (1) no war; (2) an agreement that ends a war; (3) a peaceful situation with no unpleasant noise; (4) a feeling of calmness and lack of worry and problems; (5) a situation in which there is no quarrelling between people who live or work together (Langenscheidt-Longman 1995: 1041). Many dictionaries combine a state of no war with a positive state of harmony. In Russian 'mir' refers to both 'peace' and the 'world'. In pre-Hispanic cultures 'peace' implies an equilibrium between nature and humans, gods and humans, as well as among human beings. Peace may also be linked to the oriental concepts of harmony or equilibrium. In traditional societies such equilibrium has been very important (Oswald 2008a: 10).

The *Brockhaus Encyclopaedia* (19th ed., 1988, vol. 7: 660–663) defined peace as a "condition of a treaty-based and secured living together both within social unity and among groups, societies or organizations", as the opposite to war that will not last without a minimum order and consensus. After the Cold War, the *Brockhaus Encyclopaedia* (21st ed., 2006, vol. 9: 774–779) defined peace as a concept pointing to "harmonious relations … among peoples, groups, organizations, interest groups and states". Peace was considered as a stable process pattern of an international system that guarantees that inter-state conflicts are being resolved without the use of organized force that requires democratization.

The peace concept has emerged from different roots, in Europe from the Greek 'eirene' (*Ελρήνη*), Roman 'pax', pax romana or peace within the borders (limes) of the Roman Empire, and the Christian tradition ('pax Christiana') in the Middle East from the Hebrew 'shalom' and Arabic '*salām*', and in South Asia from 'ahimsa' (peace with nature). The Jaina *ahimsa* "no harm" adds the ecological dimension that was missing in the occident. In other cultures, different values, goals, and other concepts (law, security, justice, harmony with nature) are also associated with 'peace'. The Hinduist and Buddhist philosophy of the unity and connection among all living species widened the understanding of nonviolence, and for the Jaina religion nonviolence is the major religious duty to avoid a harmful karma. Mahatma Ghandi based his struggle for independence on 'ahimsa' (Dadhich 2008) and Martin Luther King promoted nonviolence against racial discrimination of Afro-Americans.

In Greek philosophy, Plato argued that war and conflicts should be avoided within the polis. Aristotle combined peace with politics and emphasized that all political goals may only be realized under conditions of peace, and war is only acceptable as a means for the defence of the polis. During the Roman period, 'pax' was closely tied to law and contracts, and with the emergence of the Roman Empire, the imperial *Pax Romana* relied on contractual subjugation under the emperor in exchange for protection against external intruders.

Augustine developed a comprehensive Christian concept of peace that distinguished between peace on earth (*pax humana*) and peace of God *(pax divina*). Thomas Aquinas stressed the close connection of peace with justice (*iustitia*), but

also with the love for other human beings (*caritas*). For him peace is a political good, reflecting goals of the state, and a precondition for a good life. During the 14th and 15th centuries, several convents called for a peace among contentious Christian factions (*pax Christiana*), and the Westphalian Peace of 1648 requested that all parties adhere to the '*pax Christina universalis perpetua*'. After the Peace of Utrecht (1713), Abbé de Saint-Pierre called for a federation of princes to secure a '*paix perpétuelle*' in the tradition of peace proposals from Thomas More's *Utopia* (1516) to William Penn's *Essay towards the present and future peace in Europe* (1693), and by utilitarian (Bentham) and socialist authors (Fourier, Saint-Simon).

Besides the 'peace within the state' that was achieved through its monopoly of the means of force and its use, the 'peace between and among states' has become a major concern of modern international law since the 16th (de Vitoria, Suárez) and 17th century (Grotius, Pufendorf). Its authors still considered war as a legitimate means for the realization of interests among states (*ius ad bellum*), while calling for constraints during war, such as a continuation of diplomacy and the activities of neutral organizations (*ius in bello*). In his treatise for an *eternal peace* (1795) Kant went a step further and proposed a ban on war itself and developed a legal framework for a permanent peace based on six preliminary and three definite articles that called for a democratic system of rule, an international organization (League of Nations), and the respect for human rights. In the 19th and early 20th centuries many writers glorified war (*bellicists*) while *pacifists* and the peace movement of the late 19th century advocated a condemnation of war. After the Mexican independence (1810) Benito Juárez introduced the principle: "the respect of the rights of others is peace" in treaties with other countries. In modern theories of hegemonic stability *Pax Americana* refers to a peace as proposed by the USA.

After World War I, the Kantian tradition was instrumental for the creation of the League of Nations, while after World War II, Hobbesian lessons were drawn from its collapse. The United Nations (UN) gained 'teeth' with the advent of the Security Council, and during the Cold War a bipolar power system based on military alliances and the terror of destructive arms prevailed. With the end of the Cold War, war as a social institution returned as resource, ethnic, and religious conflicts, primarily within states but also as pre-emptive wars not legitimized by the UN Security Council and against the expressed preferences of many state members. Since the 1980s there has been an intensive debate in international relations on the 'liberal peace' (Paris 2004; Campbell et al. 2011) or 'democratic peace' (Russett 1993; Oren 1995; Hermann and Kegley 1995; Layne 1994; Rosato 2003; Spiro 1994). During the 1990s proposals for a new international order in the Kantian and Grotian traditions were gradually replaced by power-driven concepts of preventive wars and the 'war against terror'.

Peace has been defined as a basic value (Zsifkovits 1973) and as a goal of political action, as a situation of non-war, or as a utopian and more just world. Schwerdtfeger (2001: 28–29) distinguished four alternatives to define peace: (1) a nominal definition; (2) as a result of a contemplative hermeneutic process; (3) a review of the historic evolution of the concept; (4) a determination by an analysis of

opposite concepts. Galtung (1967, 1968, 1969, 1988, 2013) distinguished between a condition of 'negative' (absence of physical or personal violence—or a state of non-war) and 'positive peace' (absence of structural violence, repression, and injustice), taking the form of "economic exploitation and/or political repression in intra-country and inter-country class relations". In his mini-theory of peace. (Galtung 2007; Galtung and Fisher 2013) argued that "Peace is not a property of one party alone, but a property of the relation between parties". He distinguished among negative (disharmonious), indifferent and positive (harmonious) relations that often result in *negative* (absence of violence, cease-fire, indifferent relations) or *positive peace* (harmony; 1993: 688–689). Senghaas (1997, 2013) pointed to five conditions of peace among nations. (1) positive interdependence; (2) symmetry of interdependence; (3) homology; (4) entropy; that require (5) common softly regulating institutions. In his 'civilisatory hexagon' Senghaas (1994, 1995, 2013) referred to six related aspects: (1) an efficient monopoly over the use of force; (2) effective control by an independent legal system; (3) interdependence of social groups; (4) democratic participation; (5) social justice, and (6) a political culture of constructive and peaceful conflict transformation. Among the many attempts to define peace, no consensus on a generally accepted minimal definition emerged. According to Czempiel (1986) peace has an institutionalized patterned process of no-war. For Brock (2002: 104f.) peace should be more than the absence of war in the framework of time (eternal peace), space (peace on earth), society (domestic intra-societal peace), procedure (peace as peaceful dispute on peace), and a heuristic dimension to move from the causes of war to the conditions of peace.

Alger (1999: 13–42; 2014) provided a map of 24 peace tools that can be derived from efforts of peacebuilding during the 19th century (2 tools) and the 20th century (22 tools) which he associated both with the negative (11) and the positive (13) peace concept. Alger (1999: 40–42) filed the 24 peace tools into nine categories: "(1) words, (2) limited military power, (3) deterrent military power, (4) reducing weapons, (5) alternatives to weapons, (6) protecting rights of individuals and groups, (7) collaboration in solving common economic and social problems, (8) equitable sharing of economic, communications and ecological systems, and (9) involvement of the population at large through peace education and organized participation."

In the UN Charter of 1945, the 'concept of peace' has been mentioned among the purposes of the UN in Art. 1,1: "to maintain international peace and security", and "to take effective collective measures for the prevention and the removal of the threats to the peace, and for the suppression of acts of aggression or other breaches of the peace", as well as peaceful conflict settlements. Wolfrum (1994: 50) pointed to both narrow and wide interpretations of peace in the Charter. In Art. 1(2) and 1 (3) the UN Charter uses a wider and positive peace concept when it calls for developing "friendly relations among nations" and for achieving "international cooperation in solving international problems of an economic, social, cultural, or humanitarian character". A wider concept of peace was the basis for the "Proclamation of the International Year of Peace" in GA Res. 40/3 of 3 October 1985 that stated that the promotion of international peace and security required continuing and positive action by peoples and states (Wolfrum 1994: 51).

In chapter VI on the Pacific Settlement of Disputes, Art. 33 uses a 'negative' concept of peace that is "ensured through prohibitions of intervention and the use of force" (Tomuschat 1994: 508). In Chapter VII of the UN Charter dealing with "Action with Respect to Threats to the Peace, Breaches of the Peace, and Acts of Aggression", in Art. 39, a 'negative' concept of peace prevails, referring to "the absence of the organized use of force between states". In a Security Council meeting on 31 January 1992 the Heads of States and Government "recognized that the absence of war and military conflicts amongst states does not in itself ensure international peace and security" (Frowein 1994: 608). In the framework of Chapter IX on "International Economic and Social Cooperation", Art. 55 (3) refers to the "universal respect for, and observance of, human rights and fundamental freedoms". It has been suggested, to include "the right of self-determination, to peace, development, and to a sound environment" (Partsch 1994: 779) as "human rights of the third generation" (Vasak 1984: 837).

In the UN Charter of June 1945, a narrow or a 'negative' concept of peace has been in the centre with a few direct references to 'positive' aspects to be achieved by 'friendly relations among nations', and by 'international cooperation'. No reference is included in the Charter that refers to 'peace with nature', nor can extreme outcomes emerging from global environmental change be conceptualized as 'threats to the peace'. The 'positive peace' concept refers to peaceful social and cultural beliefs and norms, the presence of economic, social and political justice and a democratic use of power including nonviolent mechanisms of conflict resolution. 'Sustainable peace' or 'peace with nature' was added later in the debate within the UN and therefore first we turn now to the ecology concept.

1.2.2 Ecology

Ecology is based on the two Greek terms 'oikos' (οἶκος) equivalent of a household, house or family and 'logos' (λόγος) speech, philosophy or science. It is the root of both economics and ecology. The *Shorter Oxford English Dictionary* ([5]2002: 789) defines ecology as: "1. The branch of biology that deals with organisms' relations to one another and to the physical environment in which they live; (the study of) such relations as they pertain to a particular habitat or a particular species; also human ecology; 2. The political movement that seeks to protect the environment, esp. from pollution."

The *ecology* concept was coined by Ernst Haeckel (1834–1919) for the study of living species and their physical and biotic surroundings. The ecology concept was developed by many scientists from different disciplines and world regions, based in part upon observations of indigenous cultures in the Americas, in China, India and the Middle East where knowledge on the use and dangers of plants and animals were crucial for human survival and cultural development. It was deeply influenced by Darwinan theory that focused on competition as a selective force. During the late 19th century the concept was used for the ecology of animals,

plants and in hydrobiology, while a modern definition includes (a) the interactions between organisms (individuals, populations, biocoenosis), (b) in their abiotic and biotic environment and (c) the links in the energy, material and information flow. According to Ellen (1996: 207), the ecology concept "has been centrally concerned with the concept of adaptation and with all properties having a direct and measurable effect on demography, development, behaviour and spatio-temporal position of an organism". *Biological ecology* has been concerned "with population dynamics, energy transfer, systems modelling, nutrient cycles, environmental degradation and conservation; and since the 1970s, especially with the application of neo-Darwinian thinking of socio-ecology". *Human ecology* is used in human geography, urban sociology and anthropology. Ellen argued that "the other major impact of ecological concepts in the social sciences has been in the relation of political environmentalism, and to environment and development… Increasing attention is also being paid to the cultural construction of nature, indigenous technological knowledge, the management of collectively owned resources, and environment history" (Ellen 1996: 208).

Vladimir Vernadsky (1926) defined the biogeochemical cycles as the sum of all ecosystems. Arthur Tansley (1935) established an interactive system between the living created (biocoenosis) and their environment (biotope) and ecology which he transformed into a science of ecosystems that was crucial for the development of ecology as a modern systems science. Odum (1953, 1975, 1977, 1998) defined ecology as the study of the linkages of organisms and of groups of organisms with their environment and on their structure and functions (Nentwich et al. 2004: 1). Eduard Suess (1875) proposed the term biosphere, including the conditions that are promoting life on Earth, such as flora, fauna, minerals and different cycles. The nitrogen cycle, the atmosphere, hydrosphere and lithosphere were developed.

The ecology concept was used primarily in biology as 'autoecology' (referring to eco-physiology or biochemical ecology) and 'synecology', as 'populations (demographic) ecology' and as 'community ecology' and as 'systems ecology', and in physical geography as 'landscape ecology' (Troll 1968) and 'geoecology' (Huggett 1995). Therefore historically the ecology concept was basically related to the biophysical sciences and only after World War II did the concept become more integrated in the social sciences and the humanities.

1.3 Expanding Conceptualization of Peace Since the 1980s and Widening of the Ecology Concept

The scientific peace concept has expanded beyond Galtung's differentiation of 'negative' and 'positive peace', especially since the release of the Brundtland report (1987), to 'sustainable peace' (OECD 2011). The ecology concept has been taken up, e.g. in economics as 'ecological' economics and the concept has proliferated as 'deep', 'human', 'social', 'political', 'peace' and 'political geoecology.'

1.3.1 Expanding Peace Towards Environment Issues

Mahatma Gandhi's thinking, inspired by the Hinduist and Buddhist traditions and the Jaina 'ahimsa' concept on nonviolence and the environment had a significant impact on Arne Naess' environmental philosophy and 'deep ecology', and on Schumacher's (1999) 'small is beautiful' philosophy (Weber 1999: 349–361). However, neither within peace research nor environmental studies have the manifold linkages between peace and ecology been systematically explored.

Within peace research few scholars addressed environmental problems and challenges, among them Kenneth Boulding (1966, 1978) and Elise Boulding (1988, 1989, 1992, 2000). In *The Economics of the Coming Spaceship Earth* (1966, 1970),[2] Kenneth Boulding used the symbol of cowboys arguing that the world of unlimited resources is coming to an end and in *Ecodynamics* (1979)[3] he combined evolutionary biology, ecology, peace research and Keynesian, socio and environmental economics (Khalil 1996). Later, Boulding (1983) critically reviewed the arguments for and against ecosystems and his concept of the 'empty niche' in biology, societal evolution and artefacts, biological catastrophes, ecological and human interactions, social ecosystems and finally, evolutionary economics. Elise Boulding, sociologist, feminist and a mother of peace education, linked peace to ecology from a practical daily experience, insisting that there is no true peace without ecological links, respect for nature and human ecology (Morrison 2005).

From a peace education perspective, *Hutchinson* (2009) reflected on the links between peace, environmental and futures education arguing that "the direct and indirect environmental impacts, … of unequal patterns of global consumption and bloated military budgets cannot be adequately understood by staying within the conventional disciplinary, interpretative frame of economics [and that] … enhanced cross-disciplinary and cross-cultural dialogue are likely to be important". Hutchinson considers a "cross-cultural and inter-civilisational dialogue [as] crucial, including a greater awareness of Islamic, Confucian, Taoist and Buddhist knowledge traditions on peace and the environment".[4]

Special care must be given to post-conflict peace-building processes, where pollution and resource scarcity may create further conflicts and insecurities. Intra-state and inter-state cooperation is insufficient and the establishment of early warning systems and good governance are often lacking, which has threatened sustainable peace (Swain and Krampe 2011).

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[2] See: http://www.jayhanson.us/page160.htm.

[3] See for a summary by Tanya Glaser, http://www.colorado.edu/conflict/peace/example/boul7525.htm.

[4] Francis P. Hutchinson, 2009; "Reflections on the connections between peace education, environmental education, futures education" (March); at: http://www.globalepe.org/article_view.php?aid=25.

1.3.2 Widening of the Security Concept Towards the Environment and Ecology

Since the end of the Cold War many peace researchers have significantly contributed to the discourse on the reconceptualization of security (Brauch et al. 2008, 2009, 2011), especially on its environmental dimension as 'environmental security' (Buzan et al. 1998; de Wilde 2008), 'ecological security' (Mische 1989, 1992, 1998), 'green security' (Käkönen 1994) and on the 'environmental dimension of human security' (Brauch 2005a, 2005b, 2009; Sygna et al. 2013) and on the environmental impact of war for environmental and comprehensive security (Westing 2013, 2013a).

1.3.3 Widening Ecology

The ecology concept has been conceptualized by many social scientists as 'deep ecology' (Leopold 1949; Naess 1973, 1989; Pepper 2002), 'human ecology' (Marsh 1864; Young 1974; *Human Ecology*[5]), 'social ecology' (Bookchin 1988, 2005), 'ecofeminism' (d'Eaubonne 1974; Mies, 1998; Shiva/Mies 1997), eco-Socialism' (Pepper 2002a), 'political ecology' (Thone 1935) and 'political geoecology' (Brauch et al. 2011).

'Ecological Economics' has evolved since the late 1980s when the *International Society for Ecological Economics* (ISEE)[6] was established with the statuary goal to advance "our understanding of the relationships among ecological, social, and economic systems and the application of this understanding to the mutual well-being of nature and people, especially of the most vulnerable, including future generations" (Norgaard 2002: 37). ISEE aims to facilitate "understanding between economists and ecologists and the integration of their thinking into a trans-discipline aimed at developing a sustainable world", with a special focus on modeling, equity, indicators, limits to development, trade and development, valuation and policy instruments.

'Human ecology' (Young 1974; Douglas 2002) studies gradually evolved in geography, sociology, psychology, anthropology, zoology, epidemiology, public health, economics, and natural ecology examining the relationship between humans and their biophysical, social, and built environments. Marsh (1864) addressed in *Man and Nature* the ecological relations between humans and their urban environments. In its first edition (1973), the interdisciplinary journal *Human Ecology* referred to "genetic, physiological, and social adaptation to the environment and to environmental change", including "social, cultural, and psychological

[5] See the website of the journal *Human Ecology* at: http://www.hunter.cuny.edu/humaneco/.

[6] See ISEE's mission on its website: http://www.isecoeco.org/ and at: (http://www.isecoeco.org/about/cross-discipline-approach/).

factors in the maintenance or disruption of ecosystems… interrelations of technological and environmental changes…the relation of food quality and quantity… and to demographic change". Today problems facing individuals and how actors deal with their consequences at the individual level are also addressed. Research in *Human Ecology Review*[7] argues that the discourse has shifted toward applying principles of human ecology.

The 'political ecology' concept is used since the 1930s in human and development geography, anthropology and in ecology to explain "the political dynamics surrounding material and discursive struggles over the environment in the third world" (Bryant 1998: 80–89). It studies "the relationships between political, economic and social factors with environmental issues and changes" trying to politicize environmental phenomena. Some integrated it "with political economy (Peet and Watts 1996: 6)" studies on "degradation and marginalization, environmental conflict, conservation and control, and environmental identities and social movements (Robbins 2004: 14)". Bryant and Bailey (1997) pointed to key assumptions of political ecology including the unequal distribution of costs and benefits that reinforce existing social and economic inequalities that have political implications. Human ecology required half a century until humans understood that global colonization resulted in a major ecological transformation.

Laferrière and Stoett (1999) discussed the debate on the linkages between *International Relations Theory and Ecological Thought* since the 1990s. They distinguished between *utilitarian ecology* (utilitarian anti-environmentalism, conservationism), *authoritarian ecology* (ecofasicsm, Gaia and misanthropic ecology) and *radical ecology* (deep ecology, social ecology, ecosocialism and ecofeminism) and reviewed the debate in IR on realism, liberalism and critical IR theory and ecology.

The 'deep ecology' concept was coined by Arne Naess (1973) considering humans as part of nature and of the earth and critiquing its abuse that prevailed in the Western worldview. Deep ecology calls for preserving natural diversity and calls for lifestyles that rely on "simplicity, frugality, self-reliance" and limits of the size of human population (Pepper 2002: 211).

'Social ecology' integrates "the study of human and natural ecosystems" focusing on the "relationship between culture and nature" (Pepper 2002a). Murray Bookchin (1990) conceptualized it "as a critique of current social, political, and anti-ecological trends, [that] espouses a reconstructive, ecological, communitarian, and ethical approach to society". He argued that "social ecology advocates a reconstructive and transformative outlook on social and environmental issues, and promotes a directly democratic, confederal politics. As a body of ideas, social ecology envisions a moral economy that moves beyond scarcity and hierarchy, toward a world that reharmonizes human communities with the natural world,

[7] See the website of the journal Human Ecology Review, at: http://www.humanecologyreview.org/.

while celebrating diversity, creativity and freedom" (Bookchin 2005: 85–87).[8] In Pepper's interpretation (2002a: 484) Bookchin's approach does not prioritize nature over human society and it sees "humankind as evolution's highest expression, e.g. nature's consciousness, so human transformation of nature is natural and desirable". Research and training, institutes and degree programmes, scientific associations and research programmes on 'social ecology' have been set up in the USA (*Institute on Social Ecology* [ISE][9]), in the UK (Social Ecology London[10]) and in Germany (since 1989: *Institut für Sozialökologische Forschung*, Frankfurt [ISOE][11]) and the research programme on *social ecological research* funded by the German Federal Ministry on Research and Education (BMBF).[12]

The term 'ecofeminism' was introduced by Françoise d'Eaubonne (1974) "to call attention to women's potential to bring about an ecological revolution" and it now refers to "interdisciplinary perspectives on the inextricable interconnections among human systems of unjustified domination—both of humans and earth" (Warren 2002: 218). Environmental philosophy with a gender perspective is a novel systemic approach to a complex reality from critical, interdisciplinary and constructivist perspectives. Alice Irene Bugallo (s/d) argues that environmental philosophy or ecophilosophy not only highlight current environmental problems but are associated with values, cultural and economic patterns and styles, which the more affluent societies or groups should seriously reconsider. To deconstruct this dominant model and reconstruct a comprehensive and sustainable scientific concept from a gender perspective, different theoretical and empirical approaches challenged the positivist androgenic Western liberal vision of the world, such as epistemological feminism, empirical feminism, postmodern feminism and point of view feminism. These theoretical approaches refer to empowerment and liberation from the shackles of patriarchy and therefore have questioned the liberal and neoliberal worldview of business-as-usual. Ecofeminists (Mies 1998; Bennhold-Thomsen and Mies 1999; Oswald Spring 1999, 2009) linked the mechanisms of oppression of women to the exploitation of nature.

Reardon (1996, 2014) was among the first feminists analysing the links among patriarchy, culture of war, authoritarianism and violence. The symbolic distribution space assigned to the predominantly male public and of the economic output

[8] Bookchin, Murray, 2005: *The Ecology of Freedom: The Emergence and Dissolution of Hierarchy* (Oakland: AK Press): 85–87.

[9] See: ISE, Prescott College, NY, USA http://www.social-ecology.org/about/about-the-ise/, which offers an extensive bibliography of Bookchin: http://www.social-ecology.org/learn/published-books/.

[10] See at: http://socialecologylondon.wordpress.com/ and a bibliogrphy at: http://socialecologylondon.wordpress.com/articles-and-reviews/.

[11] See on ISO, Frankfurt at: http://de.wikipedia.org/wiki/Institut_f%C3%BCr_sozial-%C3%B6kologische_Forschung and direct at: http://www.isoe.de/en/isoe/; for its publications see at: http://www.isoe.de/en/publications/: especially: Becker and Jahn (2006).

[12] See for details at: http://www.sozial-oekologische-forschung.org/ and a selected bibliography of the sponsored research: http://www.sozial-oekologische-forschung.org/de/494.php.

is the *res publica* and therefore became *homo sapiens*, while women were symbolically located in the private sphere or in the home and considered socially as *homo* (*dona*) *domesticus* (Lagarde 1992). Reardon analysed these antagonisms arguing that building security is based on peace education (Reardon and Nordland 1994), exposing the underlying power relations and the exercise of violence. She claimed that the deep roots of often subconscious violence are rooted in gender relations that emerged over thousands of years.

Barad (1999) established a bridge between descriptive and normative epistemology, and between naive realism and social constructivist approaches. She argued that all knowledge has practical, descriptive elements, where analytical components explain the phenomena globally. The outcomes of these critical ecophilosophical trends were systematized from a gender perspective in 'deep ecology', ecofeminism, social ecology, or different schools of environmental ethics. All assume some degree of criticism of anthropocentrism, biocentrism between shades and weak anthropocentrism. Speciesism is questioned (moral discrimination of individuals on the basis of the species to which they belong) by an anthropocentric understanding of nature, cornucopian overexploitation of Mother Earth and humankind.

Influenced by the debate on *landscape ecology* (Troll 1968). Huggett (1995) introduced 'geoecology' as an interdisciplinary natural science,[13] which he defined as the study of the "structure and function of geoecosystems" in different scales. Geoecology focuses on geoecological systems, their nature, hierarchical structure, and ideas about their interdependence and integrity, exploring internal or 'ecological' interactions between geoecosystems and their near-surface environment. Geoecology looks at the influence of climate, altitude, topography, insularity, and substrate including the role of external factors, both geological and cosmic, as agencies disturbing the dynamics of the geoecosystems. For Blumenstein et al. (2000: 9) geoecology "defines structures, functions and modes of action within geosystems or between them and their environment". Geoecology draws both on the spatial sciences (geography, cartography, landscape and regional planning) and on the natural sciences, but it excludes effects of environmental degradation or environmental stress and their outcomes. They called for an integration of legal, social science and economic aspects but ignored the political dimension. While Huggett's (2000) definition of geoecology combined geography with ecology, Stüdemann (2008: 9) defined geoecology as a holistic science whose objects are "geoecosystems and the images of all spatial and temporal structures of the geosphere. They are analysed with inventory process and structure analyses regarding systems stability and change and defined for an action maxim."

But in this approach the political dimension is limited to environmental planning reflecting the requirements of sustainable development. It introduces landscape and geoecology into the development of environment policy, law and

[13] See definition of 'geoecology' at: http://www.answers.com/topic/geoecology, based on: *Oxford Dictionary of Geography* (1992, 1997, 2004).

education and implementation strategies on the global level. But as other geoecological approaches, Stüdemann (2008) lacks a specific political dimension in his horizontal widening of the theoretical scope of geoecology including sustainability goals.

In 1998 the Latin American Centre of Social Ecology (*Centro Latino Americano de Ecología Social* [CLAES], Gudynas 1999) integrated geoecology with policy, with a strong emphasis on economic equality. This Centre supported strongly the World Social Forum in Porto Alegre, and in 2006 the *Centre for Development, Economy, Ecology and Equity* (D3E) in Latin America was set up, where geoecology and human ecology were key themes. During the Earth Summit in Rio de Janeiro (1992) the precautionary principle was systematically introduced into the geoecological thinking in Latin America (Cafferatta 2004).

Brauch (2003) argued that a *political geoecology* is needed that combines the divergent approaches of 'geoecology', 'social ecology' and 'human ecology'.[14] Such a wider *political geoecology* must combine the complex causes and interactions of key factors of regional environmental change with environmental stress, natural disasters, distress migration, crises, and conflicts. Relying on the results of the natural sciences, *political geoecology* should also use methods of political science and international relations. Brauch et al. (2011) used the concept of a 'political geoecology' responding to earlier proposals by Alker and Haas (1993) for a new *ecopolitics* or by Dalby (2000, 2002, a, b) for an *ecological geopolitics.* While Dalby (2000) approached *eco-geopolitics* from critical geopolitics (1998) and challenged the framing of environmental matters in terms of national security, Brauch (2003, 2003a) argued that a *political geoecology* is needed that combines the regional implications of global change and its potential outcomes: disasters, environmentally-induced migration, crises, and conflicts, and Oswald (2008a) stressed the triggering factors and focused on social vulnerability. Adding climate into the discussion challenges the traditional meanings of security. It does so precisely because the new geopolitical context of the Anthropocene (Crutzen 2002, 2011) requires a forward looking, anticipatory understanding of security, not the old one that emphasizes monitoring borders, providing insurance or cleaning up after a disaster.

Political geoecology suggests a more explicit focus on ecology and also a clear indication that human choices are shaping the world of the future. The recognition of our actions emerges in many parts of the world as the debate about climate change suggests that our predecessors and ourselves have made in shaping the future condition of the biosphere. This terminology suggests the inapplicability of traditional geopolitical notions of an external environment for discussions of human security in the future. Brauch et al. (2011; Steffen et al. 2004) argued that the analysis of the security impacts of global environmental change in the Anthropocene requires the knowledge produced by both the *geoecology* programmes

[14] This section is based on Brauch et al. (2011).

in physical geography, earth system science and numerous other disciplines, and by *social ecology* and *human ecology* approaches combining scientific efforts in geography, sociology, psychology and political science.

1.4 Linkages Between Peace and Ecology

While both the scientific peace and ecology concepts have significantly changed since the end of the Cold War, the scientific exchange between peace research and the different ecological approaches has been limited and most research occurred within the confinements of the respective research programmes. The conceptual bridge-building by Kenneth and Elise Boulding since the 1960s had few followers, while the policy debate and scientific research on the linkages between environment or ecology and security rapidly expanded (Brauch et al. 2008, 2009, 2011) first within national and international security but increasingly also in the context of human security (Sygna et al. 2013), which Oswald Spring et al. (2009) had suggested for the fourth phase of environmental security research.

With the shift of the focus of environmental security research from environmental scarcity, degradation and conflict (Homer-Dixon 1991, 1994, 1999; Bächler 1998, 1999; Bächler et al. 1996, 2002) to the dangers and concerns posed by global environmental and climate change, the debate focused again on the linkages from the perspective of national, international and human security (Brauch 2009; Scheffran et al. 2012; Gleditsch 2012). Since the 1970s, Westing (2013, 2013a) examined both the environmental impacts of war and made major conceptual contributions in the late 1980s to the development of environmental, comprehensive and human security.

After UNDP (1994) had launched the human security concept, the traditional narrow understanding of military and political security was widened to include the economic, societal and ecological security dimensions but also deepened to human and gender security from the household to the global context. With this widening and deepening of security its reference objects changed from sovereignty and territory to human beings and humankind. The values at risk shifted to identity, sustainability and survival, while the sources of threats changed from other states to global environmental change, regressive globalization and financial crises. Human beings are not only the producers of greenhouse gases (GHG) and waste but also the victims of increasing disasters (IPCC 2012).

With the direct impacts of humans upon ecosystems in the Anthropocene (Crutzen 2002, 2011) and with the progressive securitization of issues of global environmental change (GEC) during the past decade, these anthropogenic changes are increasingly threatening human lives and livelihoods, and may at some stage during this century be considered as a direct threat to international peace and security based on Art. 39 of the UN Charter, especially from the perspective of those Pacific Small Island Developing countries whose territorial survival is put at risk due to the projected sea-level rise in a 4 °C world (Nichols et al. 2011).

Worldwide, the destruction of the key ecosystem services, pollution of air, water and soil, land use change and anthropogenically-induced extreme events is creating new threats for Earth and humankind, especially for the most vulnerable in poor countries.

Reviewing the emerging global change discourse, Conca (1994: 20) suggested an "environmental agenda for peace studies" and a discussion on whether "ecologically desirable futures include concerns for peace and justice" arguing that it is not enough "to place 'sustainable development' and 'ecological security' alongside peace or social justice as 'world-order values'" but that scholars must ask that "not only their formal definitions, but also their methaphorical and institutional associations, further the purposes of peace, justice, and community".

Later, Conca (2002: 9) fundamentally challenged a core premise of the debate on environmental and ecological (in)security and conflict by asking "whether environmental cooperation can trigger broader forms of peace" by defining peace "as a continuum ranging from the absence of violent conflict to the inconceivability of violent conflict" by addressing also "problems of structural violence and social inequality" and by "building an imagined security community" based on peaceful conflict resolution. This work was indirectly inspired by Mitrany's functionalist ideas where environmental cooperation "through cooperation in international environmental agreements" may foster "international peaceful behaviour".

Conca et al. (2005: 150) called for "building peace through environmental cooperation" noting that "most environmental peacemaking initiatives fall into one of the three partially overlapping categories: efforts to prevent conflicts related directly to the environment, attempts to initiate and maintain dialogue between parties in conflict, and initiatives to create a sustainable base for peace". They argued that environmental peacemaking may help "forestall environmentally induced conflict,… soften group grievances that … are worsened by ecological injustices", which is also identified as 'negative peace', while a second approach "moves beyond conflicts with a specifically environmental component, seeking to build peace through cooperative responses to shared environmental challenges", thus partly aiming at 'positive peace'.

UNEP's activities on the environmental impact of war (Haavisto 2003), and the ENVSEC initiative (Cheterian 2009) in the Balkans, the Caucasus and Central Asia may have been inspired by concerns about environmental insecurity and hopes for environmental peacemaking.

1.5 Evolution of Peace Ecology

Influenced by both sides of the debate on environmental (in)security and peacemaking, Kyrou (2007) suggested a new 'peace ecology' (Sect. 1.5.1). After a brief critical review this concept will be jointly discussed with proposals for a political geoecology for the Anthropocene (Sect. 1.5.2), before five conceptual pillars for a peace ecology approach will be outlined (Sect. 1.5.3).

1.5.1 Introducing Peace Ecology

Kyrou (2007) introduced the 'peace ecology' concept as an "integrative, multi-contextual, and case sensitive approach in identifying resources for conflict and violence transformation" with the goal "to include issues of conflict analysis and peacebuilding" into environmental studies. The concept emerged from the debate on 'environmental security' and 'environmental peacemaking'. A shortcoming of this approach is "the lack of a common worldview and the absence of a shared philosophical space in relating ecology with peace". Some applied 'environmental peacemaking' to 'peace parks' (Ali et al. 2005, Ali 2008, 2009), eco-museums (Davis 1999; Vietnam 2006), ecovillages (Bang 2005), peace museums (Yamane 2007) and cultural heritage sites either as "an environmental problem-solving" or as a "peace-building tool".

Kyrou argues that peace ecology "applies a worldview approach to environmental peacemaking" where both people and the environment benefit from overcoming cultural violence against the environment resulting from "monolithic, mechanistic and unsustainable methods of resource extraction" or a business-as-usual approach, or ecological violence that refers "to the direct injury to the environment through pollution, degradation, overexploitation …, especially in cases of severe or irreversible damage". In his view, "peace ecology values the preservation and harmonious interaction of societies with the nature of peace; at the same time, it values a society striving to maintain positive peace as an ecological asset". Peace ecology, he claims, links the value of biodiversity with that of cultural diversity and aims to protect the environment and to maintain the peace far into the future. Other elements of his peace ecology approach are bioregionalism, the 'do-no-harm' principle that aims at the "preservation of positive peace in society while maintaining ecological integrity". He claims that "peace ecology places the environmental peace-making activities within the context of bioregions and examines their impact on various forms of violence".

Kyrou (2007a) also introduced a *sustainable peace assessment method* (SPAM) for evaluating "the effectiveness of environmental peace making projects" in terms of a) "their potential in reducing or removing violence, of the qualitative and quantitative transformation", b) "the qualitative and quantitative transformations that it may generate for each form of violence", and c) "the degree in which the project may contribute to or reinforce a balanced and sustainable coexistence and interdependence between people and nature". His SPAM should include five tools: (i) conflict assessment maps/guides; (ii) conflict-specific investigative tools, (iii) a SPAM archive, (iv) engagement with local communities and (v) a violence assessment matrix.

So far this 'peace ecology' approach has not been taken up and discussed by schools of peace and environment studies. In our view, peace ecology must be reconcecptualized and this approach must be developed further by linking it to the political geoeology approach (Brauch et al. 2011).

1.5.2 Reconceptualizing Peace Ecology

Peace ecology calls philosophically for "peace with nature" (Meyer-Abich 1979) that is increasingly being challenged and endangered by the manifold anthropogenic interventions into the earth system (Crutzen and Stoermer 2000). Peace with nature has gradually been socially constructed as global environmental and climate change, since the early 1970s as a scientific issue, since the late 1980s as a political problem and since the start of the 21st century as a security danger (see Chap. 2 by Brauch).

To achieve 'peace with nature' is both a domestic and international task where human behaviour has to be brought back in line with the wholeness of nature, where increasing hazards and disasters are an expression of the disharmony and lack of peace of humankind with nature. For Meyer Abich (2003: 84; in: Simonis 2003) 'peace with nature' can be addressed both from an ethical (ecological ethics) and a legal perspective (environmental law). In the Anthropocene human beings and humankind have become both a major threat to nature but also its victims and can by their own action also become part of its (re)solution.

How humans respond to these new threats to the survival of the species but also of plants and other animals through a declining biodiversity depends not only on the worldview of the scientists but also on the mindset of the elites and on whether the carbon lobbies succeed. Business-as-usual prevails when the political, economic and military elites are unwilling or unable to act to address the root causes of global environmental and climate change. Many religious leaders, scientists, and policymakers have called for an alternative vision aiming for a new scientific revolution (Kuhn 1962), for a fundamentally different worldview shifting to an alternative paradigm of sustainable development (Clark et al. 2004) and sustainable peace (Scheffran 2011; OECD 2011), where the ethical goal of 'peace with nature' can be achieved (Oswald Spring and Brauch 2011; Brauch et al. 2015).

1.5.3 Linking Political Geoecology and Peace Ecology

Wilson (1998) noted a growing *consilience* (interlocking of causal explanations across disciplines) in which the "interfaces between disciplines become as important as the disciplines themselves" that would "touch the borders of the social sciences and humanities". We have seen above that within the social and policy sciences peace and environmental studies have coexisted but with very limited cooperation. The cooperation between natural scientists working on geoecology, in programmes on earth systems science (ESS) or assessment (ESA) on the new issues of global environmental change and climate change has not been easy either. Therefore Brauch et al. (2011) by adding a 'political dimension' to spatially sensitive 'geoecology' called on the natural sciences to bring perspectives from the social and policy sciences in, especially those focussing on security,

peace, development and the environment, but also on the social sciences to reflect the new knowledge produced in the natural sciences and to establish a systemic approach between both.

As a result of linking 'ecology' as a scientific concept that focuses on manifold linkages itself with the normative ethical, political and scientific goal of peace, scientific analysis must be broadened as must the action-oriented political thinking and associated strategies, policies and measures to achieve the goal of peace with its different features of a 'negative', a 'positive', a 'cultural', an 'engendered' and a 'sustainable peace'. This implies that peace ecology should be conceptualized in relation to the five key pillars of a peace ecology quintet embracing peace, security, equity, gender and sustainability.

1.5.4 Five Conceptual Pillars of Peace Ecology

In the context of the 'reconceptualization of security project,' a 'conceptual quartet' among security, peace, development and the environment were examined (Brauch 2008a, b). Further, four conceptual pillars of the 'security dilemma' (peace and security), 'sustainable development' (development and environment) the 'survival dilemma' (security, development and environment) and 'sustainable peace' (peace, development, environment) were discussed. Finally, six dyadic linkages were reviewed pertaining to peace and security (Wæver 2008), peace and environment (Oswald Spring 2008), peace and development (de Soysa 2008), development and environment (Brown 2008), development and security (Uvin 2008) and security and environment (Dalby 2008, 2009).

Peace ecology in the Anthropocene may be conceptualized within the framework of five pillars we introduce here as the 'peace ecology quintet' consisting of peace, security, equity, sustainability and gender. To conceptualize the linkages between peace and security we refer to 'negative peace' and for the relationship between peace and equity we use the 'positive peace' concept, for interactions between peace, gender and environment we suggest the 'cultural peace' concept and finally for the relations between peace, equity and gender we propose the concept of an 'engendered peace.'

The five pillars of peace ecology refer to different conceptual features of peace. The classic relationship between 'international peace and security' in the UN Charter refers to a narrow political agenda of *negative peace* without war and violent conflict aiming at the prevention, containment and resolution of conflicts and violence or the absence of 'direct violence' in wars and repression. To achieve peace with equity or *positive peace* points to the absence of 'structural violence' due to overcoming social inequality, discrimination, marginalization and poverty with a lack of access to sufficient food, water, health and educational opportunities (Fig. 1.1).

Sustainable peace refers to the manifold links among peace, security and the environment, where humankind and the environment as the two interdependent parts of global Earth face the consequences of destruction, extraction and pollution

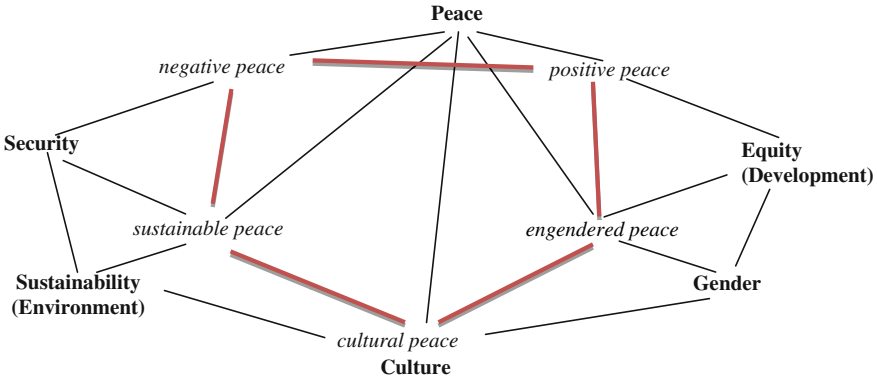

Fig. 1.1 Five pillars of peace ecology and their four linkage concepts of negative, positive, cultural and engendered peace. *Source* The Authors

(Oswald Spring 2008). The sustainable peace concept includes also the processes of recovering from environmental destruction, reducing the human footprint in ecosystems through less carbon-intensive process, and in the long-term possibly carbon-free and increasingly dematerialized production processes, so that future generations may still be able to decide on their own resources and development strategies.

The relation between peace, the environment and gender may result in *cultural peace*, to facilitate creating peace in the minds and actions of humankind within a culturally and environmentally diverse world. This *cultural peace*, also called by UNESCO 'Culture of Peace' is socializing people to overcome any religious or social discrimination, by establishing human and natural rights that are granted and enforced equally for all people independent of their race, cast, class, sex and beliefs to develop the ability for negotiating peacefully the existing and upcoming conflicts and sharing equally political, economic, social and cultural powers. They are also respecting different ecosystems taking into account their vulnerability related to human actions.

Finally the links between peace, equity and gender introduces what we call *engendered peace*, creating relations between and among men and women, children, young and elderly people based on equity to build up capacities for negotiation, exchange, sharing, bargaining and developing tools, where the most vulnerable are empowered through development processes, nonviolent conflict management, and disaster risk reduction.

1.6 Expanding Peace Ecology

Tidball and colleagues (Tidball and Krasny 2007, 2013) have argued that a focus on urban landscapes around the world may lend important insights into the expansion of resilience and peace ecology discussions. They have used a social-ecological

systems framework to help understand the potential of urban community greening and other civic ecology approaches in building resilience and thus reducing risk in the face of disaster and conflict. Other approaches may focus more on the intersection of ecology and social justice or emancipation. For example, Desfor and Keil (2004) claim, "Ecology provides much of the base for urban conflict. It is the matter through which urban regimes reorganize themselves, with which elites embroider their projects of state and market control. Yet it is also the basis—forever rejuvenated in new waves of subversive urbanism—for a new urban political ecology strongly articulated with projects of emancipation, democracy, and justice" (Desfor and Keil 2004). Similar to the work of Tidball and colleagues, education scholars (Gruenewald 2003) have called for the integration of place-based approaches focusing on local ecology and biodiversity, with Freirean critical pedagogy focusing on social justice for oppressed populations, and with learning from the traditional cultures and knowledge that have enabled communities to live sustainably for generations. Urban community greeners and other civic ecologists integrate place-based activities, such as planting community gardens or monitoring local biodiversity, with learning from multiple forms of knowledge including that of community members and outsiders, often leading to civic activism such as advocating for green spaces, for financial security, and for reduction of crime and violence. In so doing, they build human, social, natural, financial, and physical capital that becomes integrated into constructive, positive feedback loops. In this way, community greeners integrate diversity, self-organization, and learning to create the conditions that spawn resilience in the face of conflict.

Thus, urban community greening, local biodiversity monitoring, and similar activities are tools that could become part of a larger civic ecology 'tool kit' or approach for building urban peace and resilience. Should relief and development NGOs, governments, international agencies, the scientific community, social movements, and community greeners work together to foster, implement, and assess the impact of civic ecology approaches as an adaptive co-management 'peace ecology' strategy before and after conflict and war, we will be one step further in understanding how to build resilience and peace in urban socioecological systems. Ultimately, such research and adaptive co-management efforts should be directed to helping policy makers understand the role of civic ecology tools in building resilience in cities both before and after conflict or war.

1.7 On the Chapters in this Book

The following eight chapters are divided into three parts. The co-editors from Germany, the USA and Mexico explore in the first part different aspects of peace ecology, while in part II authors working in Australia, the USA and Japan apply peace ecology in environmental education, mobile learning and rebuilding community after disasters, and in part III authors from Canada and Japan address ability expectations and Satoyama sustainability and peace.

In Chap. 2 Hans Günter Brauch argues that since the Copenhagen conference in 2009, global climate diplomacy has become paralyzed. Since 2004 the physical and societal impacts of climate change were 'securitized' in the policy debates, and since 2007 the scientific discourse on climate change and security emerged. In 2009, the UN Secretary General referred to climate change both as a 'threat multiplier' and as a 'threat minimizer' pointing to proactive transformative policies towards sustainability. This chapter reviews both debates arguing that the security consequences of climate change may be countered by strategies and policies aiming at 'sustainability transition.'

In Chap. 3 Keith G. Tidball discusses community-based ecological restoration to enhance resilience and transitions toward peace. The chapter engages the call for identifying sources and mechanisms of resilience and introduces five mechanisms in an attempt to address identified gaps in the resilience literature, and to further efforts to better understand and utilize community-based ecological restoration in enhancing resilience and transitions toward peace.

In Chap. 4, Úrsula Oswald Spring examines social and environmental vulnerability in a river basin in Mexico that is highly affected by global environmental and climate change due to glacier melting of Popocatépetl, flash floods, droughts, urbanization, land use changes, inadequate waste management, overuse of water and social marginalization especially for young people and the elderly. The global financial crisis, the lack of a countercyclical policy of the Mexican government and the migration policy of the USA have limited international migration as a possible adaptation process, often bringing people to the limits of survival. Changes and adaptation are complex phenomena understood differently in the scientific disciplines and by affected people.

In part II Kazuhiro Monden addresses in Chap. 5 how risk communications embodied in online resources can support, empower and educate individuals throughout different stages of disaster, as identified in disaster sociology, which explores social phenomena resulting from human responses to social disruptions after disasters. He argues that risk communication through various online resources allows individuals to transform their experiences into knowledge to adjust skills required for recovery, reduce fear and anxiety, and can empower and educate individuals through facilitating increased resilience, social cohesion and rebuilding of communities.

Jeannie Lum explores in Chap. 6 the growth of the ecology of environmental learning research programme focusing on understanding how garden-based programmes can spread awareness of the sustainability crisis and presenting preliminary results of a university peace environmental course in transforming human consciousness as a precondition to existential changes in lifestyle.

In Chap. 7, Kazuyo Yamane discusses building peace by rebuilding community, arguing that it is necessary to educate young people and children about gender equality and the preciousness of building peace at school and in communities through media and peace museums. Japanese women's organizations have contributed at the grassroots level focusing on nuclear weapons, nuclear energy, human rights, the environment and sustainable development cooperating with

women in other countries, e.g. protesting against building nuclear power plants in Kochi.

In Chap. 8 Gregor Wolbring investigates a "Culture of Peace through an Ability Studies and Disability Studies Lens" from the perspective of UNESCO's concept of the 'Culture of Peace,' human security and a UN report on *A new global partnership* highlighting the utility of the two lenses not only for disabled people but also for defining the relationship between ability diverse humans in general and human-animal and human-nature relationships.

In Chap. 9 Ryotaro Katsura introduces the Japanese concept of Satoyama and discusses its relationship with peace. He argues that the effects of the tsunami and the nuclear power plant accidents caused by the unprecedented great earthquake stimulated many Japanese to radically reconsider the relationship of human beings with nature. Satoyama studies are a source of ideas to reintroduce the forces of nature into human culture creating a way of life, where humans coexist with nature, recovering the true quality of life while reconsidering unbridled economic growth.

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Part I
Exploring Peace Ecology

Chapter 2
From Climate Change and Security Impacts to Sustainability Transition: Two Policy Debates and Scientific Discourses

Hans Günter Brauch

Abstract Since the climate conference in Copenhagen in 2009 global climate diplomacy faces a 'climate paradox' as reflected in the policy declarations by the G8 to reduce their greenhouse gases (GHG) by 80 % by 2050. Several countries failed to implement their legal GHG reduction obligations under the *United Nations Framework Convention on Climate Change* (UNFCCC) of 1992 and the Kyoto Protocol of 1997. A 'climate paradox' is a result of the dominant Hobbesian 'business-as-usual' climate and security policies. Since 2004 the physical and societal impacts of climate change were 'securitized' in the policy debates in the context of international, national and human security. Since 2007 the scientific discourse on climate change and security emerged, where in the social sciences several approaches are distinguished: (a) qualitative vs. quantitative approaches; (b) scenario analysis; (c) scientific modelling; (d) discourse analysis and (e) causal analysis. In 2009, the UN Secretary General in a report on the climate change security nexus referred to climate change as a 'threat multiplier' prevailing in the security debate and to climate change as a 'threat minimizer' pointing to proactive transformative policies towards sustainability. This chapter briefly reviews both debates arguing that the security consequences of climate change may be countered by strategies and policies aiming at sustainability transition.

Keywords Climate change and security discourse · Climate paradox · Global climate change · Hobbesian policy · Security impacts · Sustainability transition

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2.1 Introduction: Two Alternative Discourses

This chapter reviews two parallel policy debates and scientific discourses dealing with the societal impacts of climate change *reactively* by addressing them as security dangers and *proactively* as opportunities to realize a sustainable development path. This chapter argues that to overcome the paralysis of global climate diplomacy since 2009 a departure from the prevailing and reactive BAU approach is needed that resulted in a 'climate paradox'. Oswald Spring and Brauch (2009) pointed to an alternative vision of a "fourth sustainability revolution" that requires major changes in the 'worldview' of scientists, in the 'mindset' of policymakers, in the 'culture' of citizens and consumers, and in climate-conscious forms of local, national and international governance (Held et al. 2011, 2013).

The first debate addresses possible security consequences of the present global climate policy where the state parties failed to stabilize the GHG emissions from 1990 until 2000 according to the *United Nations Framework Convention on Climate Change* (UNFCCC) of 1992 and to reduce the global GHG by 5,2 % under its Kyoto Protocol of 1997 (in force since 2005) until end of 2012.

The emerging second scientific debate on a new scientific revolution aiming at sustainability (Clark et al. 2004), on sustainability transition (ST) in Central Europe (Grin et al. 2010) refers to a process of transformative science (WBGU 2011; Schneidewind and Singer-Brodowski 2013) and proactive policies aiming at a long-term and fundamental transformative change in values, behaviour, production, consumption and governance.

One major goal of the *Sustainability Transition and Sustainable Peace* (STSP) project and of its STSP handbook (Brauch et al. forthcoming) is to contextualize these multiple emerging but often unrelated streams of debate in the framework of the key purpose of the UN Charter "to maintain international peace and security" (Art. 1,1), "to develop friendly relations among nations" (Art. 1,2) and "to achieve international co-operation in solving international problems" (Art. 1,3) where ecological challenges and those of global environmental change where not yet recognized.

The social construction of these challenges did not evolve until the 1960s and 1970s when these dangers and concerns were gradually 'scientized,' 'politicized' and during this century also 'securitized' (Scheffran et al. 2012), reaching the United Nations. On 11 June 2009, the UN General Assembly (A63/281) requested "the Secretary-General to submit a comprehensive report … on the possible security implications of climate change" (UNGA 2009). In this report of 11 September 2009 the Secretary-General (UNSG 2009) referred to climate change as both a 'threat multiplier' that prevails in the national security approach and as a 'threat minimizer' aiming at sustainable development.

Secretary-General Ban-Ki Moon identified five channels through which climate change could affect security:

(a) *Vulnerability*: Climate change threatens food security and human health, and increases human exposure to extreme events.

(b) *Development*: If climate change results in slowing down or reversing the development process, this will exacerbate vulnerability and could undermine the capacity of states to maintain stability.
(c) *Coping and security*: Migration, competition over natural resources and other coping responses of households and communities faced with climate-related threats could increase the risk of domestic conflict as well as have international repercussions.
(d) *Statelessness*: There are implications for rights, security, and sovereignty of the loss of statehood because of the disappearance of territory.
(e) *International conflict*: There may be implications for international cooperation from climate change's impact on shared or undemarcated international resources (A/64/350: 1).

Climate change as a 'threat minimizer' points to proactive policies towards sustainability (Fig. 2.1) including "climate mitigation and adaptation, economic development, democratic governance and strong local and national institutions, international cooperation, preventive diplomacy and mediation". To respond to and prevent climate change-induced security threats the report suggested an international capacity "to anticipate and prepare itself to address a number of largely unprecedented challenges posed by climate change for which existing mechanisms may be inadequate", focusing on climate-induced displaced persons and migrants, to the "statelessness of citizens of submerged island nations", water-

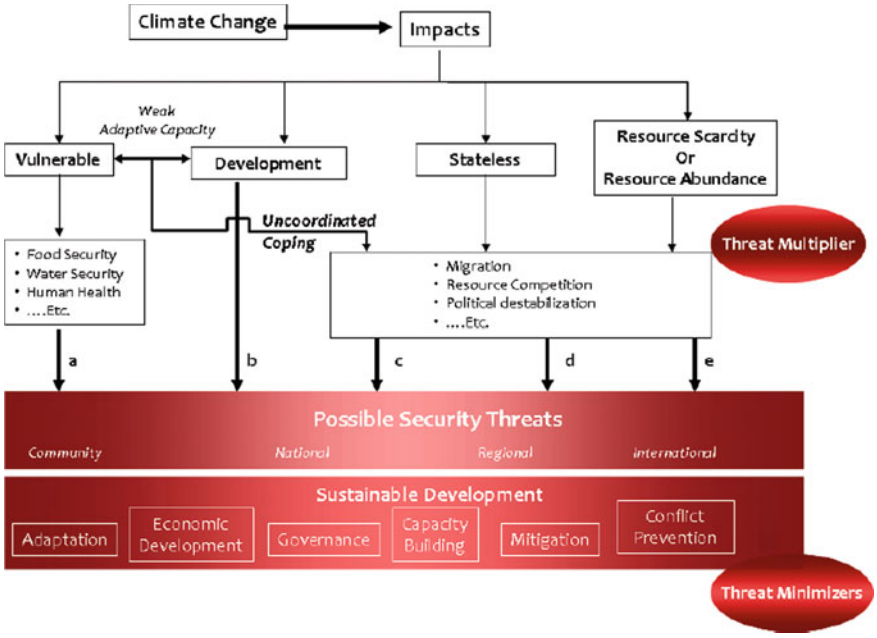

Fig. 2.1 Channels of threat multipliers and threat minimizers. *Source* UNSG (2009: 7)

scarcity and the increased competition "over newly accessible Arctic natural resources and trade routes".

This UN report points to two policy debates and scientific discourses that will be discussed in this chapter: (a) since 2002 on the 'securitization' of climate change (2.3) that resulted in scientific analyses using (i) scenario analysis, (ii) scientific modelling, (iii) discourse analysis and (iv) causal analysis (2.4). The alternative discourse (2.5) appeared in 2005 (2.6). The *sustainability transition and sustainable peace* (STSP) project addresses consequences of non-action and postponement of action in dealing with probable impacts of global environmental change and a possible 'peace dividend' of a long-term transformation of the global and national economic and energy systems towards sustainable development goals (2.7). This chapter concludes that a policy strategy aiming at sustainability transition must overcome the climate paradox (2.8).

This chapter argues that due to the rapid increase in GHG emissions since 1990 a 'climate paradox' has evolved (2.2) that may only be overcome with strategies aiming at a 'sustainability transition' towards a gradually decarbonizing world economy (2.7), where the violent consequences of business-as-usual policies may be avoided.

2.2 Assessment of GHG Emissions since 1990 and Compliance with the Kyoto Protocol: A Climate Paradox

According to UNFCCC's assessment of the national greenhouse gas inventory data for 1990–2010 "total aggregate GHG emissions excluding emissions/removals from land use, land-use change and forestry (LULUCF) for all Annex I Parties decreased by 8.9 % and total GHG emissions/removals including LULUCF decreased by 14.6 %." However, without LULUCF the GHG emissions increased for Australia by 30 %, Spain by 25.8 %, Canada by 17.4 %, and the USA by 10.4 % (UNFCCC 2012: 1).

According to preliminary estimates of the International Energy Agency during 2012 "global carbon-dioxide (CO_2) emissions from fossil-fuel combustion reached a record high of 31.6 gigatonnes (Gt) in 2011. … This represents an increase of 1.0 Gt on 2010, or 3.2 %."[1] According to the IEA's 2012 edition of its *CO_2 Emissions from Fuel Combustion—Highlights* global GHG emissions increased from 1990 to 2010 by 44.4 %, for all Annex I countries they declined by −3.7 % and for Annex I Kyoto parties by −12.4 %, but for North America they rose by 11.4 %, i.e. for Canada by 24 % and USA by 10.3 %. However, for all non-annex

[1] See IEA Press Release of 24 May 2012: "Global carbon-dioxide emissions increase by 1.0 Gt in 2011 to record high", at: http://www.iea.org/newsroomandevents/news/2012/may/name,27216,en.html.

I countries GHG emissions increased by 114.7 % (IEA 2012: 48). By 2010 the ten top CO_2 emitting countries from fuel combustion were China, USA, India, Russia, Japan, Germany, Korea, Canada, Iran and UK (IEA 2012: 9).

Globally, from 1990 to 2010, GHG emissions increased significantly and several Annex I countries failed to achieve their GHG reduction targets under the Kyoto Protocol by end of 2012, most particularly Australia (+39.5 %), New Zealand (+31.8 %), Canada (+30 %), Japan (+13.4 %) while for the economies of transition GHG emissions dropped by 33.9 % (IEA 2012: 9).

So far most developing countries objected to accept any legally binding GHG emission reduction targets, most particular China, whose emissions are projected to double between 2005 and 2030 (IEA 2007). From 1990 to 2010, major changes in GHG emissions have occurred between Annex I and Non-Annex I countries (Fig. 2.2), most particularly for China (+226.4 %; accounting for 24 % of global emissions in 2010) and India (+179.2 %; accounting for 5 % of global emissions in 2010) (IEA 2012: 50) and they are projected to double for India from 2010 to 2035 (IEA 2012: 23).

According to an analysis of the UNFCCC Secretariat (Fig. 2.3) 21 governments with obligations under the UNFCCC (Annex I Parties) reported that they would meet their targets under the KP relying only on national policies and measures (P&Ms), while 14 expected "to meet their targets under the Kyoto Protocol only by a combination of domestic action and the use of Kyoto Protocol mechanisms" (UNFCCC 2012a: 11). Figure 2.1 refers to nine Annex I parties that are also parties to the KP, which the US never ratified, and from which Canada withdrew in December 2011. There is an emerging consensus among many scientists that the

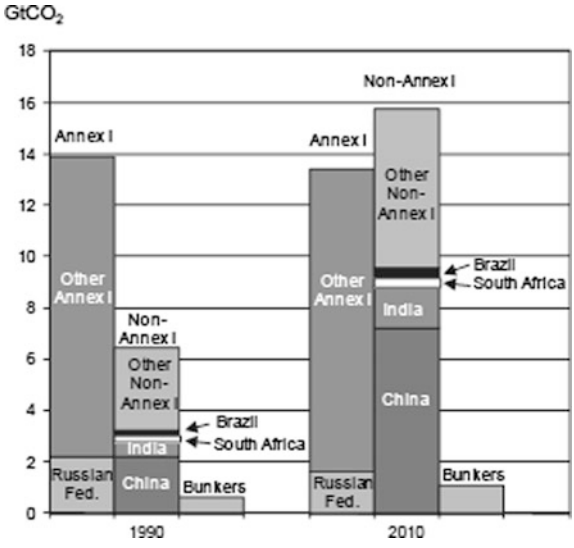

Fig. 2.2 The growing importance of GHG emissions in BRICS countries. *Source* IEA (2012: 19)

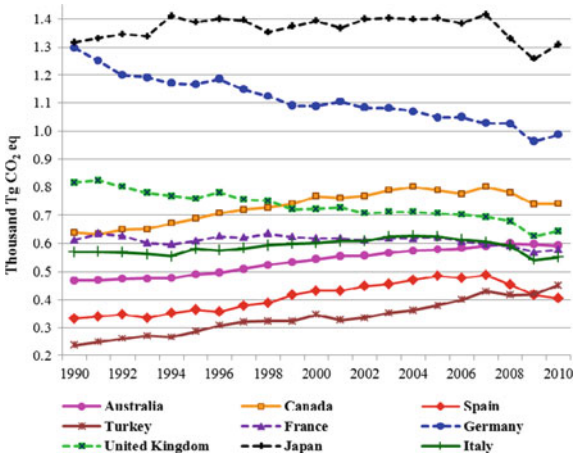

Fig. 2.3 Greenhouse gas emissions excluding land use, land-use change and forestry of Annex I Parties that do not have economies in transition that are also Parties to the Kyoto Protocol and that have the largest contribution to total aggregate emissions. *Source* UNFCCC (2012a: 16) based on: National greenhouse gas inventory submissions for 2012; at: http://unfccc.int/ghg_data/ghg_data_unfccc/items/4146.php

goal to stabilize GHG emissions at 2 °C above pre-industrial levels by 2100 has come beyond reach and that humankind may be confronted with a 4 °C (New et al. 2011) increase of global average temperature above pre-industrial levels and an increase of GHG concentrations in the atmosphere far above 450 ppm. On 26 May 2013 the GHG concentration in the atmosphere reached 400 ppm, and has thus increased by 85 ppm in 55 years.[2]

The concept of a 'Climate Paradox' (Brauch 2012) refers to a fundamental contradiction in the behaviour of developed (G8) and threshold countries (G20), as reflected in their policy declarations and their lacking implementation. The G8 confirmed the IPCC findings and supported the goal to stabilize the increase of global average temperature at 2 °C above the pre-industrial level by 2100. From 2007 to 2011, the G8 in their annual summit declarations, e.g. in May 2011 in Deauville (France), declared as the goal: "of developed countries reducing emissions of greenhouse gases in aggregate by 80 % or more by 2050, compared to 1990 or more recent years". This goal was dropped in May 2012 during the US presidency and in June 2013 during the British presidency the issue was taken from its agenda.[3] In 2013, only the EU seems to still adhere to this goal, e.g. in its

[2] See: US NOAA: "Trends in Atmospheric Carbon Dioxide"; at: http://www.esrl.noaa.gov/gmd/ccgg/trends/weekly.html; and "Weekly mean CO_2 and historical comparisons"; at: ftp://ftp.cmdl.noaa.gov/ccg/co2/trends/co2_weekly_mlo.txt.

[3] "Sign of the times: G8 Summit drops climate change from agenda"; at: http://hockeyschtick.blogspot.de/2013/06/sign-of-times-g8-summit-drops-climate.html. For an analysis see: Robert Falkner, LSE: "The burning hole at the heart of the G8 agenda. Why was climate

Energy Roadmap 2050 of 15 December 2011. But in late June 2013, German Chancellor Merkel blocked higher emission targets for cars and before her governments had challenged its own emission reduction targets of 40 % by 2020, cutting the subsidies for renewables under its Renewable Energy Act of 2000.[4] Whether the EU countries will remain a climate policy leader will depend on the "new 2030 climate and energy targets" the EU Commission will propose in autumn of 2013, upon which EU leaders will have to decide by March 2014, prior to the COPs in Warsaw (2014) and Paris (2015) when the next legally binding agreement is to be adopted to replace the KP. The *Climate Action Network* (CAN) cautioned: "Continuing 'business as usual' would mean putting the livelihood of millions of European (and other) citizens at risk."[5]

The strategies and policies of the G-20 (Figs. 2.4 and 2.5) that accounted for about 80 % of the global GHG emissions in 2007 reflect the prevailing *business-as-usual* (BAU) approach where possible security consequences become an object of *reactive* policies.[6] Both the prevailing climate policies of non-action or of postponed action and the focus on possible military responses are an expression of a realist, power-centred or *Hobbesian* outlook that has addressed the national security impacts of global environmental change and climate change, since 2007 primarily in the USA, while the EU pointed to international security consequences from a *proactive* perspective (Brauch 2009).

2.3 First Discourse: Securitization of Climate Change

Since 2002 the physical and societal impacts of climate change were securitized in policy debates and scientific discourses on international (EU, UN), national (USA) and human security (HSN, IPCC). On the climate change and security nexus policymakers differed:

– From an international security perspective many UN member states emphasized in the General Assembly (UNGA 2009) and Security Council (UNSC 2007, 2011) the need to prevent climate change becoming a 'threat multiplier' that

(Footnote 3 continued)
change marginalised at the 2013 G8 summit?"; at: http://blogs.lse.ac.uk/politicsandpolicy/archives/34244.

[4] See Climatesolutions: "Bundesregierung blockiert schärfere EU-Abgasgrenzwerte" (28 June 2013); at: http://www.climatesolutions.travel/umwelt/bundesregierung-blockiert-schaerfere-eu-abgasgrenzwerte.

[5] CAN: "EU Already at 27% below 1990 – Time for Merkel, Hollande and Cameron to Wake Up", 12 June 2013; at: http://www.climatenetwork.org/blog/eu-already-27-below-1990-%E2%80%93-time-merkel-hollande-and-cameron-wake.

[6] See University of Toronto, G8 Centre; the reference to the aggregate total GHG Emissions (for 2007 unless otherwise stated) [Mtonnes per CO2 equivalent] were compiled by Masa Kovic, "G8 and G20 Data on Climate Change", updated 26 June 2010a.

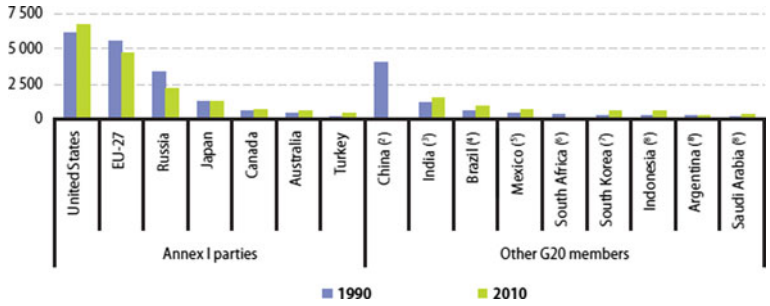

Fig. 2.4 Greenhouse gas emissions, 1990 and 2010 of Annex I and other G20 countries (million tonnes of CO2 equivalent). *Source* The most recent data and tables by Eurostat on greenhouse gas emissions from 1990 up to present may be found at: http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database. See also the most recent Report from Eurostat: *Annual European Union greenhouse gas inventory 1990–2011 and inventory report 2013* that may be obtained at: http://www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2013

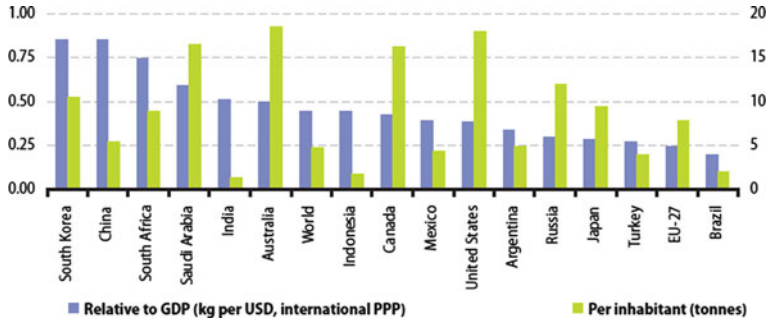

Fig. 2.5 Quantity of carbon dioxide emissions of selected countries relative to GDP and per person (2008). *Source* http://epp.eurostat.ec.europa.eu/statistics_explained/images/6/6c/Quantity_of_carbon_dioxide_emissions%2C_2008_%281%29.png

may trigger a violent escalation of existing conflicts by strengthening sustainability strategies, and thus to minimize security threats (Sect. 2.3.1).

– From the perspective of US national security, the interest of the defence and intelligence community is in how the military can continue to operate in a world where climate change impacts are increasing and how the US can maintain its position as the single military superpower and influence outcomes in the interest of its national security. Thus, the focus is primarily on conflict management but also on conflict prevention (Sect. 2.3.2).
– From the perspective of human security, the goal is to avoid climate-induced violent conflicts that would affect the livelihood of human beings, most particularly those with the highest degree of social vulnerability in the poorest countries, who lack the capacities for proactive adaptation and mitigation and whose capacity for resilience is limited (Sect. 2.3.3).

The discussion on linkages between climate change, security, and conflicts has been conceptually influenced by earlier research on environmental security. Based on environmental conflict research, the debate on security implications of climate change began in 1989 (Brown 1989; Gleick 1989; Swart 1996; Scheffran 1997; Edwards 1999; Rahman 1999). The climate-security nexus was taken up since 2000 (Gleditsch and Nordas 2009; Bohle and O'Brien 2007; Webersik 2010; Scheffran et al. 2012) by consultants (BMU 2002; Schwartz and Randall 2004; CNA 2007), governments (WBGU 2008; NIC 2008, 2012) and international organizations (EU 2008, 2008a; UNSG 2009).

2.3.1 *Climate Change and International Security: EU and UN*

The publication of the fourth IPCC Assessment Reports (IPCC 2007), debates in the United Nations Security Council [UNSC] and General Assembly [UNGA]), and the award of the Nobel Peace Prize to the IPCC in fall of 2007 gave high political visibility to climate change and its impacts. The UK took the lead on 17 April 2007 in putting this challenge on the agenda of the UNSC,[7] while Germany put this issue on the agenda during its dual presidency of the EU and of G-8 in 2007. A report for the German environment ministry (BMU 2002) addressed the linkage between climate change and conflicts (Brauch 2002). Based on a report on *Climate Change as a Security Risk* (WBGU 2008), the German government proposed an EU strategy on the security impacts of climate change.

The public policy debate on the securitization of climate change evolved in the UK beginning in 2004 when ministers and high-level policy advisers, scientists and diplomats addressed this linkage (Stern 2006, 2009). UN Security Council Res. 1625 (14 September 2005) had called for promoting sustainable development as part of a broad strategy of conflict prevention. On 14 March 2008, the Council of the European Union released a paper on "Climate change and international security" (S113/08) that specifically recommended enhancing capacities at the EU level (building up knowledge, assessing the EU's own capacities, improvement in the prevention of, and preparedness for early responses to disasters and conflicts). With regard to "cooperation with third countries" the paper calls for "revisiting and reinforcing EU cooperation and political dialogue instruments, giving more attention to the impact of climate change on security". The EU took up the political debate on the securitization of climate change in the UK and in Germany,

[7] This debate is documented at: "Press Conference by Security Council President, 4 April 2007"; at: http://www.un.org/News/briefings/docs//2007/070404_Parry.doc.htm; UN Security Council, SC/9000, 5663rd meeting, 17 April 2007: "Security Council holds first-ever debate on impact of Climate change on peace, security, hearing 50 speakers"; at: http://www.un.org/News/Press/docs/2007/sc9000.doc.htm.

and the European Council became a major 'securitizing actor' in translating the scientific messages into concrete policy proposals.

Since 2007, many other international organizations have worked on climate change. In March 2008 the World Bank addressed the "Social Dimensions of Climate Change" (Mearns and Norton 2009), and published its *World Development Report 2010*: *Development and Climate Change* (World Bank 2010). This debate on possible security implications of global climate change culminated on 20 July 2011 during the German UNSC Presidency.

While Russia, China and many representatives of the Group of 77 (G-77) opposed this discussion by the UNSC, a coalition of OECD countries, including all EU states, the USA, Canada, Japan, South Korea, Australia, New Zealand, and the Pacific Small Island States, stressed the need to address the linkage between climate change and its potential security implications from a proactive perspective (Brauch and Scheffran 2012).

A few delegations associated the climate change debate in the UNSC with the human security concept (Oswald Spring et al. 2013), while during the specific debates in the General Assembly on Human Security on 22 May 2008, on 20 and 21 May 2010, and on 14 April 2011 many countries referred to climate change as a major threat for human security.[8]

2.3.2 Climate Change and National Security

Since 2004 several defence ministries, the military establishments, and the intelligence community have addressed climate change as a new threat to national security. In 2004 a study by Schwartz and Randall (2004) for the US Department of Defense was leaked. In 2007, a report on *National Security and the Threat of Climate Change* by the US Center for Naval Analyses (CNA 2007), and in November 2007, a second report on *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change* (Campbell et al. 2007) by the Center for Strategic and International Studies (CSIS) and the Center for a New American Security (CNAS) triggered a policy debate on climate change and US national security (Campbell 2008; Moran 2011; NRC 2013) that was taken up by the administrations of George W. Bush and Barack Obama (Brauch 2011).

[8] These debates are documented at: Statement by the President of the Security Council on "Maintenance of Peace and Security: Impact of Climate Change", S/PRST/1011/15, 20 July 2011; at: http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N11/424/28/PDF/N1142428.pdf?OpenElement; See the minutes of the all-day debate, at: http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/CC%20SPRST%202011%205.pdf and at: http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/CC%20SPV%206587.pdf and the UN summary for the press, at: http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/CC%20SPV%206587%20RES1.pdf (27 July 2011).

While the National Intelligence Council (NIC) of the CIA had ignored climate change in its projection of the world by 2020 (NIC 2004), it included the security impacts in its projection of the world by 2025 (National Intelligence Council 2008) and addressed it in its report on the world by 2030 (National Intelligence Council 2012). Retired Air Force General Charles Wald voiced support for bringing the national security bureaucracy into the debate over global warming and John J. Hamre, a deputy secretary of defence in the Clinton administration, said "global warming couched in security terms would make if far more difficult for politicians to ignore".[9] In 2010, the US intelligence community requested the NAS/NRC "to evaluate the evidence on possible connections between climate change and US national security concerns and to identify ways to increase the ability of the intelligence community to take climate change into account in assessing the political and social stresses with implications for US national security" (NRC 2013: 1).

The Obama Administration has addressed the climate change and security nexus in its Quadrennial Defense Review (QDR 2010), in its National Security Strategy (2010). In February 2010, the QDR stressed that the "DoD will need to adjust to the impacts of climate change on our facilities and military capabilities" noting that the "rising demand for resources, rapid urbanization of littoral regions, the *effects of climate change*, the emergence of new strains of disease, and profound cultural and demographic tensions in several regions are just some of the trends whose complex interplay may spark or exacerbate future conflicts". DoD acknowledged that "climate change will shape the operating environment, roles, and missions that we undertake". According to "assessments conducted by the intelligence community indicate that climate change could have significant geopolitical impacts around the world, contributing to poverty, environmental degradation, and the further weakening of fragile governments. Climate change will contribute to food and water scarcity, will increase the spread of disease, and may spur or exacerbate mass migration". DoD's operational readiness hinges on continued access to land, air, and sea training and test space. Managing the national security effects of climate change will require DoD to work collaboratively … with both traditional allies and new partners". In his first National Security Strategy of May 2010 (NSS 2010) President Barak H. Obama stressed a shift towards a value oriented strategy that includes "forging cooperative solutions to the threat of climate".

The *National Intelligence Council* (NIC) in its projection of the global trends for the "World by 2030" of December 2012 noted as Megatrend 4 on the growing food, water and energy nexus that "climate change will worsen the availability of these critical resources" (National Intelligence Council 2012: iv). It also listed among the potential black swains that would cause the most disruptive impact a more rapid climate change. In Africa climate change may create "new social and economic tensions that could flare into civil conflict" (NIC 2012: 3). It further

[9] Bryan Bender: "Bill ties climate to national security seeks assessments by CIA, Pentagon", in: *The Boston Globe*, 9 April 2007.

stated that climate-change-driven-migration "is likely to affect Africa and Asia far more than other continents" (National Intelligence Council 2012: 23). As the worst case outcome for climate change until 2030 the report referred to a total collapse of the climate change negotiations and as the best case cheaper and more plentiful natural gas resources (National Intelligence Council 2012: 56). It claims that the Middle East, South Asia and the Sahel zone would be most vulnerable to climate change impacts. However, from a Cornucopian perspective the report claimed that "GM Crop deployments will enable higher yields and address climate change driven food scarcities" (National Intelligence Council 2012: 91).

Responding to the request of the US intelligence community the National Research Council's (NRC) report on: *Climate and Social Stress – Implications for Security Analysis* (2013: 3) concluded that "anthropogenic climate change can reasonably be expected to increase the frequency and intensity of a variety of potentially disruptive environmental events". The NRC report concluded that "the links between climate events and security outcomes are complex, contingent, and not understood well enough to allow for prediction". The NRC Report (2013: 9–13) suggested specific measures for improving monitoring and analysis to better anticipate "national security risks related to climate events". The NRC report proposed that the intelligence community "should establish a system of periodic 'stress testing' for countries, regions, and critical global systems regarding their ability to manage potentially disruptive climate events of concern" and "countries, regions, and systems of particular security interest should be primary targets for periodic stress testing". This analytical report points to multiple research needs and restrains itself from a classical analysis of US national security threats.

Whether President Obama's strong emphasis on climate change in his second inaugural address on 20 January 2013 and whether his "climate change action plan"[10] of 25 June 2013 will result in stronger climate change policies will depend on decisions of the US Congress and especially of the Republican controlled House of Representatives. Besides policy efforts to reduce the carbon bootprint of the military by replacing hydrocarbon with renewable energy sources, it remains to be seen which role the climate change and security nexus will play and whether it will be successfully used by his administration to legitimize and implement 'extraordinary measures'.

The British Ministry of Defence (MoD) identified climate change as a key strategic trend and its Chief of Defence Staff has suggested that climate change is a threat to global security that military planners must include into their calculations. In Germany, the link between 'climate change and security' was discussed at a workshop by the German Command and Staff College (FüAk) in cooperation with the Centre for Transformation of the German Armed Forces (*Bundeswehr*) and the German Development Institute (GDI) in Hamburg in 2006 (Jopp and Kaestner

[10] See White House: "President Obama's Plan to Fight Climate Change", 26 June 2013; at: http://www.whitehouse.gov/share/climate-action-plan; "Barack Obama pledges to bypass Congress to tackle climate change", in: The Guardian, 25 June 2013; at: http://www.guardian.co.uk/world/2013/jun/25/barack-obama-climate-change-strategy (6 July 2013).

2008). In several other countries, climate change has been addressed in national security documents (Brzoska 2012), and the defence ministries of several NATO countries analysed the implications of climate change for their defence planning processes.

2.3.3 Climate Change and Human Security

Climate change also poses severe security impacts for human security and its referent objects: human beings and humankind. From this perspective, climate change was addressed by the GECHS (2005) programme in June 2005 and was the focus of the Greek Presidency of the Human Security Network (2007–2008). The conceptual debate on climate change and human security started in 2005 with a workshop on the linkage between *global environmental change and human security* (GECHS) which was the theme of an IHDP research project (1999–2009) (Barnett and Adger 2005; Barnett et al. 2008; O'Brien et al. 2010; Matthew et al. 2010; Sygna et al. 2013). Barnett and Adger (2005: 1; 2007, 2010) discussed how climate change may undermine human security, and how human insecurity may increase the risk of violent conflict as well as the role of states in human security and peace building. Schnabel (2007) addressed the linkages between climate change, human (in-) security and stability. The Millennium Ecosystem Assessment (Leemans 2009) and the Earth System Science Partnership (ESSP [Leemans et al. 2011]) and its related projects have offered a forum for the global scientific discourse (e.g. on health related issues).

During the informal debate of the UNGA on 14 April 2011 Brauch addressed "The Environmental Dimension of Human Security", and proposed a fourth human security pillar as "as freedom from hazard impacts",[11] based on previous reports (Brauch 2005, 2005a). 'Freedom from hazard impacts' calls for reducing the environmental and social vulnerability and enhancing the coping capabilities of societies confronted with environmental, geophysical, and climate-related hazards. It implies that people can mobilize their resources to address sustainable development goals. Human security as 'freedom from hazard impacts' is achieved when people who are vulnerable to environmental hazards that are often intensified by poverty, food insecurity, and improper housing in flood-prone and coastal areas are better warned of impending hazards, and are protected and empowered to prepare themselves.

Thus, by 2007 climate change was perceived by a majority of the people in many countries as a major new international, national, and human security concern. Since 2008, the impact of climate change on security in developing countries is also increasingly being addressed by the security community both for national

[11] UN, 2011: "Informal Thematic Debate on Human Security"; at: http://www.un.org/en/ga/president/65/initiatives/HumanSecurity.html; see for a detailed coverage: http://www.afes-press-books.de/html/hexagon_05_PressConf_Presentations.htm#NY2; Hans Günter Brauch: "Talking Notes", at: http://www.un.org/en/ga/president/65/initiatives/Human%20Security/DrBrauch.pdf.

security (e.g. by IDSA[12] in India) and from a human security perspective (by ISS in Pretoria).[13] Five years later, the scientific conceptualization of climate change impacts from a human security perspective has progressed. A *Climate Change and Human Security Handbook* (Redclift and Grasso 2013) is forthcoming and a chapter on "climate change and human security" in the IPCC's AR5 (2014/2015) is in preparation.[14] By 2013, the human security perspective on the climate change-security nexus has a growing impact on the scientific discourse, while the policy impact has remained negligible.

In a human security approach non-military means prevail. The development of new scientific knowledge, its technological application, and its effective political implementation matter. From a human security perspective, climate change directly impacts on water, soil, food, health, and livelihood security. Climate change will exacerbate these sectoral security problems if the communities and social groups fail to create mitigation and adaptation strategies with resilience-building through preventive learning and decisions. From a policy perspective, a holistic coping strategy requires better horizontal coordination of strategies, policies, and the measures carried out by ministries and international organizations.

2.4 Climate Change and Security in the Social Sciences

Building on the contributions of meteorologists and historians (Neville Brown 1989, 2001), in the social sciences the debate on the climate change and the security nexus has emerged both within peace research and security studies, especially by political scientists (James Lee 2009; Nils-Petter Gleditsch 2012; Brauch 2002, 2009, 2012), geographers (Karen O'Brien; Hans-Georg Bohle; Neill Adger; Jürgen Scheffran), economists (Stern 2006), sociologists (Giddens [2]2011) and psychologists (Welzer 2008).

During the 21st century, climate change may result in environmentally-induced forced movements of peoples, hunger- and famine-induced protests, and small-scale societal violence, and possibly also in violent conflicts within and between countries. While future climatic scenarios can be simulated and socio-economic trends can be projected, specific events (Gaddis 1992/1993), such as climate conflicts as the outcome of the decisions of future policymakers, cannot be predicted, rather a number of 'conflict constellations' can be foreseen (WBGU 2007,

[12] See: Institute for Defence Studies and Analyses (IDSA): "Workshop on Security Implications of Climate Change for India: A Report" (New Delhi, 6 April 2008).

[13] See the workshop by ISS (Pretoria) with IDRC (Canada) on: "Climate change and human security in Africa" (Pretoria, South Africa, 27–28 February 2008).

[14] The Working Group II contribution to the AR5, "*Climate Change 2013: Impacts, Adaptation, and Vulnerability*", will be released in March 2014; see at: http://www.ipcc-wg2.gov/AR5/ar5.html and at: http://www.ipcc-wg2.gov/AR5/AR5_authors.php (6 July 2013).

2008) that may possibly escalate into violence. The causal linkages and possible extreme societal outcomes have been discussed from four scientific perspectives:

1. *Determinists* claimed that climate change will lead to wars during the 21st century (Lee 2009).
2. *Empiricists* stressed that environmental stress and climate change contributed to forced migration and small-scale violence (Detraz and Betsill 2009; Brauch 2009; Scheffran 2011) and reviewed conflict constellations triggered by climate change (Bauer 2011).
3. *Sceptics* pointed to a lack of evidence on the link between climate change and wars (Gleditsch and Nordas 2009).
4. *Deniers* challenged these links (Lomborg 2009; Tetrais 2011). For example, Russia, China, and many G-77 countries considered climate change primarily as an issue of sustainable development, but not as an issue of international peace and security.

Five types of analyses may be distinguished:

(a) *Policy analyses* by consultants put this linkage on the agenda of national governments and international organizations.
(b) *Scenario analyses* prepared policymakers for potential future security threats posed by societal climate change impacts. They were often funded by defence ministries, intelligence agencies (US NIC), supranational (EU 2008) and international organizations.
(c) *Discourse analyses* examined policy statements of national and international policymakers and press reports on international, national, and human security (Detraz and Betsill 2009; Rothe 2012; Kurtz 2012)
(d) *Conceptual and model analyses* that stress the interactions between natural and human systems (Scheffran 2008, 2009, 2010, 2011).
(e) *Theoretical and empirical analyses* examine 'observed' and 'projected' interrelations of climate change effects on the state, society, the economic sector and on individuals, community groups, and humankind (Webersik 2010; Scheffran et al. 2012).

Work on the first two types was primarily carried out by consultants, on the third by sociologists, political scientists, and media specialists, while the last two require multi- and transdisciplinary cooperation among scientists.

In the USA and Canada a growing climate scepticism has contributed to a shift of public opinion and on the political level to a blockade of climate change implementation legislation. While some EU governments have taken up elements of the alternative paradigm in their policies for a gradual transition towards sustainability, most actions by governments, civil society, the business sector and the scientific communities are still adhering to the BAU paradigm. Combined with a declining perceived political urgency and a lack of political will these trends have favoured a 'climate paradox' (Brauch 2012) of nonbinding long-term policy declarations and the inability to adhere to legal commitments.

Within the BAU community there are two alternative policy positions of the Neo-Malthusians and of the Cornucopians (Gleditsch 2003). Many Neo-Malthusians accept the resource scarcity argument as a result of climate change and they are seriously considering possible security consequences of climate change for their own national security. In the USA, these security concerns are reflected in the studies by the CNA (2007), of the National Intelligence Council (2008, 2009, 2012) and they were incorporated in official defence documents (QDR 2010; NSS 2010; Brauch 2011; Brzoska 2012). A basic assumption and goal behind this argument is that the US military must adapt its infrastructure, missions and equipment to be able to operate in a world that is influenced by increasing societal impacts of GEC and GCC. In this policy debate, climate change was perceived as a 'threat multiplier'.

From a Neo-Malthusian perspective climate change is often analysed within a Hobbesian world. The adherents of this perspective argue that (i) climate change will result in resource scarcity, depletion and conflicts (Lee 2009); (ii) the military has to be able to operate under the conditions of climate change to protect 'our' national security, way of life, productive system and people; and (iii) the military has to reduce its ecological 'bootprint' and to adopt its infrastructure to rising sea-level and new extreme weather events by strengthening humanitarian missions.

In contrast, Cornucopians have argued that scientific ingenuity and technical solutions will enable society to cope with the effects of climate change without requiring either significant technical fixes or a fundamental transformation towards sustainability. The Cornucopian vision emphasized: (i) a priority of adaptation measures over fundamental mitigation strategies; (ii) a belief in technological fixes and breakthroughs; (iii) strategies for enhancing energy efficiency; and (iv) major initiatives and projects of geo-engineering.

Scientists claimed that a 'climate paradox' of long term policy declarations and, in many cases, the lack of the political will and of the financial, administrative, scientific and technical capabilities, may lead to a major catastrophe for humankind during this century. If the scientific worldview and political mindset of a BAU world prevails non-binding unilateral pledges are unlikely to be fulfilled after the legally binding commitments were ignored.

While among a majority of the G20 countries the strategic approach of a *business first* (among some OECD countries) or *development first* (among most developing or G77 countries) is still dominant, several countries have indicated in their declaratory politics and some in their policy planning the need to gradually shift to a low carbon economy.

For the second decade of research on climate change and security there is a need for:

- a *dialogue between the natural scientists* working on climate change issues and *social scientists* addressing observed or projected possible societal impacts that may affect international, national and human security perspectives and assessments;

- an intensive *discourse between different scientific schools* to overcome the tendency of communicating solely within one epistemic community and ignoring the results of the other school;
- a closer *debate between scientists* (of all disciplines and schools) and *policy-makers* to address areas for preventive policy initiatives to reduce the probability that climate change may trigger series security consequences, conflicts and in the worst case even wars.

2.5 Alternative Discourse: Proactive Policies Towards a Sustainability Transition and Sustainable Peace

Many scientists (Steffen et al. 2004; Leemans et al. 2011) and scientific bodies (IPCC 2007, 2011, 2012) argued for a fundamental shift in the development paradigm. Some called for a 'scientific revolution for sustainability' (Clark et al. 2004), for a 'social contract for sustainability' (WBGU 2011), for a 'long term transformative change' to sustainable development (Grin et al. 2010) and for a 'fourth sustainability revolution' (Oswald and Brauch 2011).

A new field of 'sustainability transitions research' is emerging and in 2009 a *Sustainable Transitions Research Network* (SRTN) was established, a book series on *Sustainability Transitions* was launched in 2010, and a *Journal on Environmental Innovation and Societal Transitions* (EIST) started publishing in 2011. New research institutes, programmes and projects were established in Europe.

The adherents of this alternative paradigm have argued for a shift towards sustainability transition with a (i) fundamental transformation of Western mass culture, life styles and 'way of life'; (ii) a long-term transformative change in worldviews towards sustainability; (iii) a transformation of the prevailing mindset in politics and the business community towards decarbonized and dematerialized productive processes and consumptive patterns; and (iv) a new social contract for sustainability (between state and civil society) with new forms of local, national, regional and global governance.

While the adherents of this alternative paradigm agree energy and resource efficiency is crucial for sustainable development, they argue that a gradual and fundamental transformative change cannot be achieved from the dominant worldview and mindset of the BAU approach. They insist avoiding this transformation process results in violence and wars, as the militarization of the industrial revolution in the 19th century and of the revolution in the energy, transportation, communication and IT systems in the 20th century have resulted in World War I and II and in many wars since 1945, the scientific discourse must also address potential linkages of a long-term transformative change on peace and security, whether it endangers or enhances the prospects for a sustainable peace.

The concepts of a 'sustainable development' and 'sustainable peace', as well as 'security' and especially 'human security' are highly contested in scientific and policy debates.

- According to the classic definition by Wolfers (1962) "Security, in an objective sense, measures the absence of threats to acquired values, in a subjective sense, the absence of fear that such values will be attacked". Social constructivist approaches in international relations conceive of security as a social and political interaction where social values and norms, collective identities and cultural traditions are essential. From this perspective, security is always intersubjective or "security is what actors make of it" (Wendt 1992).
- 'Human security' points to different policy agendas of violence, underdevelopment, environment and hazards and to good governance, rule of law and political, social, economic and cultural rights (UNDP 1994; Annan 2005). Human security calls for both 'protection' and 'empowerment', especially of the poor and most environmentally and socially vulnerable people (CHS 2003).
- The Brundtland Report (1987) introduced 'sustainable development' as a new global development path that was adopted at the United Nations Conference on the Environment and Development (UNCED) in Rio de Janeiro (1992) and promoted as a key policy goal of the Millennium Report (2000), and at the World Summit on Sustainable Development (WSSD) in Johannesburg (2002) and at the second Earth summit in Rio+20 (2012).
- 'Sustainable peace' is a normative concept in the social sciences and politics that implies a policy vision for the 21st century combining a 'security policy for the Anthropocene' with proposals for a 'science for global sustainability', economic strategies of 'sustainable development', where proactive action and cooperative policy implementation is crucial for a new peace strategy in the Anthropocene based on a gradual decarbonization of the global economy to cope with global environmental change impacts.

The call for a 'sustainable development' and a 'sustainable peace' suggests a fundamental change in the conceptual thinking in international relations during the Anthropocene. The proposed 'political geoecology' links the rapidly emerging *Earth Systems Science* (ESS) with global earth governance by integrating the political and security dimensions into the natural sciences and by sensitizing the social sciences and the humanities to the earth sciences (Brauch et al. 2011b).

Transformation is needed to achieve the goals adopted by the G-8 (2007–2011) to reduce GHG emissions globally for OECD countries by 80 %, and by the G-20 to implement the financial commitments for developing countries by 2020 and to move towards a green economy. Scientific worldviews must move towards sustainability, including changing values and an enhanced environmental consciousness, different ways of life and lifestyles and overcoming the gap between attitudes and behaviour. This requires also changes in the mass culture and waste economy based on a growing energy and resource consumption.

A transformation of the prevailing mindset in politics, business and society must overcome the dominant BAU paradigm and move towards a progressing decarbonization of the economy by enhancing energy efficiency (Weizsäcker et al. 1997, 2009) and a substitution of fossil energy sources with renewables. The German Advisory Council on Global Change (WBGU 2011) argued that this "new great

transformation" requires a new "social contract for sustainability" between state, society and the business sector with new forms of transformation governance.

During the second industrial revolution besides a close interaction between state, economy and society (Weber 1921, 1972, 1968, 1978) knowledge mattered and between 1700–1900 a 'knowledge revolution' (Jochum 2010) emerged with: (a) a 'horizontal' expansion and imperial penetration of the Americas, Africa and Asia, (b) a 'vertical' expansion in the aftermath of the enlightenment, and (c) a 'retrospective' one (history). Major changes in the organization of knowledge were the emergence of academies, universities and research institutions for training technical experts for innovation and management along with the emergence of modern library systems and knowledge dissemination through the media (journals). During the third technical revolution based on non-renewable energy, new transportation and communication systems and with the IT revolution (computers, internet) the access and spread of knowledge will become essential.

These new forms of knowledge-creation and dissemination require a 'pragmatist' interaction (Habermas 1968) between the political and the knowledge system to avoid 'decisionist' (scientists as legitimizers of policy decisions) and 'technocratic' (policymakers implement scientific or administrative choices) pitfalls. Those scientists who called for a second scientific revolution suggested a fundamental change in the scientific worldview (Kuhn 1962) towards sustainability.

Thus, the newly emerging research on 'sustainability transitions' addresses the societal, economic and political processes, changes and transformations needed to achieve the long-term transformative goal in specific knowledge sectors (energy, transportation, agriculture, food, health). From the perspective of international relations, as well as security and peace studies, this raises new research areas to draw lessons from the impacts of the three previous long-term and global transformations on the environment but also on peace and security, or how new forms of a militarization of societies and of revolutions in warfare can be avoided and the goal of a 'sustainable peace' may be enhanced.

The multiple innovations that emerged from the two industrial revolutions were all applied by the military making warfare more violent, widespread by increasing the number of victims. Thus, the discussion on a fourth sustainability revolution (FSR) or on a sustainability transition (ST) must also address potential conflictual consequences of the suggested transition and possible peace dividends by reducing the competition over access and control of hydrocarbon energy sources.

2.6 Emergence of the Alternative Discourse

In *Our Common Journey: A Transition Toward Sustainability* in 1999 the US National Research Council noted that in the 21st century "many human needs will not be met, life-support systems will be dangerously degraded, and the number of hungry and poor will increase" (NRC 1999: 101). The NRC also argued that "a successful transition toward sustainability is possible over the next two

generations" but that this would require "significant advances in basic knowledge, in the social capacity and technological capabilities to utilize it, and in the political will to turn this knowledge to action" (NRC 1999: 160).

The new research field of 'sustainability transition' combines "complex systems analysis, a socio-technological and a governance perspective". It has evolved since the 1990s when "innovation and technology scholars … started to address environmental innovation and sustainability transitions more explicitly" (van den Bergh et al. 2011) to which research on *technological innovation systems* (TIS) and the *multi-level perspective* (MLP) have contributed (Coenen and Truffer 2012: 4–5). The WBGU Report on a *Social Contract for Sustainability* called for a new paradigm of a 'Science for Global Sustainability'. The 'sustainability transition' proponents combine sustainable development with a long-term transformative change. *Global Environmental Change* (GEC) and *Global Climate Change* (GCC) were triggered by the first industrial revolution, while the second industrial revolution led to a fundamental change in communication and transportation systems and an evolution of new information technologies that made modern processes of globalization possible.

The 'sustainability transition' proponents address both the causes and impacts of GEC and GCC by facing and coping with both and avoiding the projected societal consequences of dangerous or catastrophic climate change and of possible 'tipping points' in the climate system (Lenton et al. 2008). Hence 'sustainability transition' may become a 'threat minimizer' towards sustainable development.

'Sustainable development' and 'sustainability transition' refer to a much wider research agenda than the relatively narrow focus on environmental and technological innovation. The process of 'transition' refers to multiple long-term evolutionary and revolutionary transformative changes. These two debates may be summarized as follows:

1. We are in the midst of a global transition in earth history triggered by the first and second industrial revolution that resulted in an anthropogenic transformation of the earth system. Therefore, Crutzen (2002, 2011) pointed to the transition from the 'Holocene' to the 'Anthropocene' due to the increase in human interventions into the earth system with a rapid increase in GHG emissions.
2. The impacts of the transformations of these processes have resulted in complex global environmental change, in climate change and biodiversity loss, what affected most environmental services.
3. The societal impacts of the physical effects of climate change and of biodiversity loss may result in major international, national, and human security dangers and concerns. These have been discussed at national and international levels since 2000 from the perspective of different scientific world views, schools of thought, and political mindsets.
4. Since 2005 an alternative discourse on 'sustainability transitions' or on 'transitions to sustainable development' has begun to evolve. It addresses new directions in the 'study of long-term transformative change' that also needs to focus on resilient societies.

2.7 Goal of the STSP Project

The *Sustainability Transition and Sustainable Peace Project* (STSP) was launched after completing the project on *Reconceptualization of Security* (Brauch 2008; Brauch et al. 2008, 2009, 2011a). STSP addresses key scientific and political challenges of the 21st century, including the relative failure of international efforts to address, face and cope with impacts of global environmental and climate change that resulted in a 'climate paradox', where industrialized countries were unable or unwilling to comply with their legally binding and declaratory global commitments since 1992. This failure is reflected in

- the inability of the international community represented by the world of states to agree on a legally binding follow-up regime to the Kyoto Protocol by the end if 2012;
- the relative failure of the Conference of Parties (COP 15–18) to the UNFCCC;
- the failure of most G8 countries to initiate measures to implement their announced goal (2007–2011) to reduce their GHG emissions by 80 % by 2050 that decided on 18–19 May 2012 at their summit in the USA not to repeat their previous commitments;
- the failure of the G20 meeting in Mexico on 18–19 June 2012 to adopt an agreement on financing climate change activities in developing countries;
- the failure of the United Nations Conference on Sustainable Development (Rio+20) in Rio de Janeiro on 20–22 June 2012 to adopt any new and legally binding decisions besides the declaratory statement: "Outcome of the Conference: The future we want".

This diagnosis has resulted in two different approaches on international security and environmental policy (Oswald Spring and Brauch 2011):

- a *business-as usual policy* that hopes market forces, economic initiatives and military power will be able to cope with the consequences of global environmental change;
- a *fourth sustainability revolution* that looks towards a long-term transition towards sustainability.

'Sustainable peace' is a normative concept that has been used in publications by the development and the peace research community that goes beyond Galtung's (2013) negative (absence of war) and positive (social justice) peace aiming at 'peace with nature' (*ahimsa*) combining the goal of peace with that of sustainable development, thus linking two highly contested concepts (Chap. 1 above). In a policy framework, sustainable peace calls for proactive strategies, policies and measures to prevent and avoid possible security impacts of global environmental and climate change and to diffuse future resource conflicts over the access and control of oil and gas after 'peak oil' has occurred.

The STSP project combines international relations with *environment, security, development and peace* (ESDP) studies to examine the impacts of both alternative policy approaches for international peace and security.

2.8 Conclusions

The climate performance of the G20 countries since 1990 has been unsatisfactory. Only Russia and most EU-27 countries have fully met their GHG reduction obligations under the KP, while among the Annex-B countries (under the Kyoto Protocol) Australia, Canada and the USA have been the laggards. The USA never ratified it, Canada withdrew in 2011 while Australia and Japan still adhere to these obligations. The G8 have repeatedly declared to reduce their GHG emissions by 80 % without agreeing on the base year (1990 or 2005). While the EU (2011) has started with its Energy Roadmap 2050 a policy process that aims at this goal, no similar commitments exist for Russia, Japan, Canada and the US. Some Non-Annex B G20 countries have made reduction pledges for 2020 under the Cancun Agreement, while no BASIC country pledged to stabilize its GHG emissions. The major change from 1990 to 2020 will occur between the Annex-1 and Non-Annex 1 countries: while the share of the global GHG emissions of Annex-1 countries will decline from above 50 % to slightly more than 1/3 that of Non-Annex 1 countries is projected to rise from below 50 % to nearly 2/3. This trend is also reflected in the global population projections for the G-20 until 2030, 2050 and 2100.

Changes in the global GHG emissions cannot be achieved by relying on a BAU approach in science, government, the business community and in society. Adhering to such an approach may increase the prospects that a dangerous or catastrophic climate change may trigger multiple security consequences.

A major change in GHG emissions requires strategies, policies and measures that aim at a 'sustainability transition' towards a low-carbon or green economy. Sustainability transition requires a major reduction of hydrocarbon energy sources (coal, oil, gas) and a significant increase of renewables linked with significant energy efficiency improvements in the energy (electricity, transportation, heating/cooling), production (industry, agriculture) and consumption sectors. Such a 'sustainability transition' includes these dimensions:

- *scientific dimension* (a new scientific revolution towards sustainability that requires a fundamental shift in the dominant scientific worldview);
- *societal and cultural dimension* (changes in values, attitudes, culture, world-views, mindsets, and behaviour);
- *economic dimension* (energy sector, production and consumption patterns) aiming at a progressively de-carbonized and dematerialized world, national and local economy;

– *political dimension* (changes in governance processes at the local, national and international level and of national and international policy goals to be oriented at a sustainable peace).

Such a fourfold process of a 'sustainability transition' is the major challenge for humankind during the 21st century in the Anthropocene. A 'fourth sustainability revolution' covering these four dimensions of a process of sustainability transition may avoid the prospects of major resource conflicts (on hydrocarbons after peak oil) and climate-induced conflicts and war; and the needed cooperation may increase the prospects for a 'sustainable peace'. Many of these questions will be addressed in the *Sustainability Transition and Sustainable Peace Handbook* (Brauch et al. forthcoming).

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Chapter 3
Peace Research and Greening in the Red Zone: Community-Based Ecological Restoration to Enhance Resilience and Transitions Toward Peace

Keith G. Tidball

Abstract A growing network of social and ecological scientists argue that change is to be expected and planned for, and that identifying sources and mechanisms of resilience in the face of change is crucial to the long-term well-being of humans, their communities, and the local environment. This 'change' can include armed conflict and civil unrest, especially as access to resources is constrained. Yet, several gaps in the resilience literature persist, including (1) a lack of studies focused on cultural systems (Wright/Masten 2005) related to change and conflict, (2) relatively few studies that explicitly re-embed humans in ecosystems in the overlapping contexts of security, sustainability, equity and peace, and (3) a need for more studies that integrate the theory and science of individual human resilience with broader ecological systems theory and research exemplified by social-ecological systems resilience scholarship (Masten/Obradovic 2008). The chapter engages the call for identifying sources and mechanisms of resilience and introduces five mechanisms in an attempt to address identified gaps in the resilience literature, and to further efforts to better understand and utilize community-based ecological restoration in enhancing resilience and transitions toward peace.

Keywords Community-based ecological restoration · Environmental security and peace-making · Greening in the red zone · Mechanisms of resilience · Resilience · Social-ecological systems · Sources of resilience · Transitions

3.1 Introduction: The Birth of Environmental Security

The intersection of peace studies and environmental studies, and, more specifically, the potential of the ecosystem to support peace stems from developments within ecological studies that set the stage for extending its scope to include issues

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of conflict analysis and peacebuilding (Kyrou 2007). Kyrou explains that while environmental conflict resolution had been an essential part of the environmental studies field for several decades, understanding the implications of the environment in terms of international security and peacebuilding has only been explored since the late 1980s when the concept of environmental security emerged.

In the 1980s and 1990s, a series of publications (cf. Baechler and Spillmann 1996; Homer-Dixon 1991; Homer-Dixon and Blitt 1998; Myers 1993) opened a debate on the link between the scarcity of environmental resources and regional conflict, which led to the eventual development of environmental security as a subfield in political science, and several scholars and researchers focused on identifying regions of the planet where environmental scarcity could trigger instability and threaten regional and global security (Klare 2001). Homer-Dixon (2001) argued that only under very special circumstances is the environment, on its own, a *source* of violent conflict. Eventually environmental scarcity was determined to play an important role in escalating existing conflicts to violence (Peluso and Watts 2001), though Baechler (1998: 38) previously hinted at this nuance and at the time pronounced that there was "…ample evidence that future environmental conflicts and their intensification and geographical expansion can only be avoided, or at least mitigated, when peaceful problem-solving and resource management are successfully implemented". Finally, in the twenty-first century, environmental security can be seen to have matured as a field of study, as indicated by theoretical debates and suggestions for multiple phases of research in the area (Dalby 2002; Dalby et al. 2009; Brauch et al. 2011). As Kyrou observes (2007), though the work of Homer-Dixon and others remained focused on the environment as a source of contention, it also prepared the ground for a variety of different and new understandings on how the environment might relate to conflict.

3.2 From Environmental Security to Environmental Peacemaking

A recent and important example of such a new understanding is the work by Conca and Dabelko (2002). While conflict and violence continue to dominate the environmental security discourse, research focusing on environmental peacemaking has challenged the assumed link to conflict. These scholars suggest that "environmental cooperation can be an effective general catalyst for reducing tensions, broadening cooperation, fostering demilitarization, and promoting peace" (Conca 2002: 9). They examine the effectiveness of environmental peacemaking through case studies in six regions: South Asia, Central Asia, the Baltic, Southern Africa, the Caucasus, and the U.S.-Mexico border. While the authors admit that these areas vary dramatically, environmental peacemaking suggests that their highly fluid security situations all create opportunities for environmental cooperation to galvanize peacemaking. Further, they argue that: (1) substantial potential for

environmental peacemaking exists in most regions; (2) environmental cooperation can enhance trust, establish habits of cooperation, forge cooperative trans-societal linkages, and create shared regional norms and identities; and (3) civil society is a crucial but underutilized component to environmental peacemaking.

Given these arguments, and despite some scepticism about whether or not environmental cooperation can lead directly to peace, it behooves us to continue to explore the environment's potential as a peacemaking asset in a continually unstable and conflict-laden world. According to Erika Weinthal (2004), three areas deserve our attention. She asks:

- Are water resources more likely than other resources to provoke conflict and/or engender peace? Intentionally or not, Conca and Dabelko (2002) largely focus on water. Are other environmental resources also positioned to foster peace?
- Most of the security threats that emerged in the 1990s are or were intrastate threats (e.g. civil war, genocide, political instability, and state collapse), suggesting that we should focus on this lower level of analysis. Could we use the environment as a peacemaking tool within states and along tenuous border regions?
- Can researchers, policymakers, and practitioners move away from conflict scenarios and environmental peacemaking towards environmental peacekeeping? To date, the environment has largely been promoted as a mechanism to mitigate hostilities and therefore bring about peace; yet, the environment might also offer opportunities in the post conflict resolution phase to sustain a fragile peace and prevent a return to violence.

3.3 Greening in the Red Zone

In response to Conca and Dabelko's promising propositions of environmental peacemaking and Weinthal's subsequent questions rises the concept of *Greening in the Red Zone* (Tidball and Krasny 2013). Put simply, greening in the red zone can be understood as post-crisis, community-based interaction with and stewardship of nature that serves as a source of social-ecological resilience for individuals, communities, and larger social-ecological systems. Greening in the red zone presents a framework to further explore peace research and community-based ecological restoration to enhance resilience and transitions toward peace. Thus far, this framework has been used to document and understand greening in multiples types of red zones (Fig. 3.1), but not yet explicitly in the context of ecology and peace.

This chapter will explicitly apply the concept of greening in the red zone to the field of peace ecology. After briefly describing terms, the chapter pivots to an emphasis on five proposed mechanisms that provide insight as to how community-based ecological restoration might enhance resilience and transitions toward peace. The chapter relies heavily on empirical research conducted in the complex emergency that arose in New Orleans at the time of Hurricane Katrina, one that

LOCATION	RED ZONE TYPE
Afghanistan	Ongoing wars in the Middle East
Berlin, Germany	Post-Cold War divisions
Charleston, South Carolina	1989 Hurricane Hugo
Cameroon and Chad	Mid 2000's civil unrest in Central Africa
Cyprus	Demarcation between Greek and Turkish Cyprus
Europe	1940's WW II Nazi internment camps
Guatemala	Ongoing post-conflict insecurity
Iraq	Ongoing wars in the Middle East
Johannesburg, South Africa	Early 2000's Soweto, Post-Apartheid violence
Kenya	Early 2000's Resource scarcity conflict
Liberia	1989- 2003 civil war
Madagascar	Costal vulnerability
New Orleans, USA	2005 Hurricane Katrina
New York City, USA	2001 September 11th terrorist attacks
Rotterdam, Netherlands	Ongoing urban insecurity
Port-au-Prince, Haiti	2010 earthquake
Russia	Post-Soviet Cold War urban insecurity
Sarajevo, Bosnia and Herzegovina	1992-1996 conflict
South Korea	Demilitarized Zone
South Korea	2002 Typhoon and coastal vulnerability
Stockholm, Sweden	Urban insecurity in times of war
Tokyo and Hiroshima, Japan	WW II bombings
United States	WW II involvement
United States	Violence and prison populations

Fig. 3.1 Locations and types of red zones where greening has been documented and linked to ecological restoration that have enhanced resilience and/or transitions toward peace. *Source* The author

included both the typical features of severe weather-related hazards as well as a militarized environment reacting to rumors and realities of violence and unrest, but includes examples from throughout the world as well.

3.3.1 Greening

While recognizing the importance of green political thought[1] and of a growing interest in a 'green economy' (Milani 2000; Pearce et al. 1992), this chapter focuses more specifically on green initiatives that emerge in a context of self-organized community development and community-based natural resources management. In fact, perhaps a significant accomplishment of such grassroots greening practices, in particular the more participatory or activist forms embodied

[1] For an overview of green political thought, see http://www.greenparty.org/ and http://www.global.greens.org.au/charter/10values(us).html

in many community gardens in New York and other large cities during periods of neighbourhood strife and unrest or after terrorist attacks (Saldivar and Krasny 2004; Schmelzkopf 1995) and in tree planting efforts in neighbourhoods that experienced a period of violence and unrest after Hurricane Katrina struck New Orleans[2] (Tidball 2013; Tidball et al. 2010), is the steady and growing mainstream acceptance of much of what was once 'fringe' green political thought. The philosopher Andrew Light (2003) has captured this notion in his description of how grassroots environmental stewardship efforts in cities are defining a new environmental movement; this civic environmental movement finds its inspiration in the work of urban 'community greeners'.

For the purposes of this chapter, the political or philosophical dimensions of greening will not be dealt with in much depth or detail. Nor will this chapter delve solely or too deeply into the broad field of horticulture, which concerns itself with growing plants in cities for ornamentation and other purposes (Tukey 1983). Rather than focus strictly on utilization of plants, an emphasis on their active *cultivation* within a social-ecological or community context will prevail, going beyond the ornamental uses of plants and nature to suggest that human relationships with plants, animals, and landscapes have a role to play in urban and other settings faced with civil war, genocide, political instability, and state collapse and representing opportunities for community-based ecological restoration to enhance resilience and transitions toward peace.

Thus, greening is operationalized as *an active and integrated approach to the appreciation, stewardship and management of living elements of social-ecological systems*. Greening takes place in cities, towns, townships and informal settlements in urban and peri-urban areas, and in the battlefields of war and of disaster. Greening sites vary—from small woodlands, public and private urban parks and gardens, urban natural areas, street tree and city square plantings, botanical gardens and cemeteries, to watersheds, whole forests and national or international parks. Greening involves *active participation* with nature and in human or civil society (Tidball and Krasny 2007)—and thus can be distinguished from notions of "nature contact" (Ulrich 1993) that imply spending time in or viewing nature, but not necessarily active stewardship. Thus, this chapter is a continuation of efforts to explore how greening can enable or enhance transitions from conflict in situations where community members actively participate in greening, which in turn results in measurable, peaceful benefits for themselves, their community, and the environment.

The term greening includes other examples of active engagement with nature that are not obviously horticulturally oriented. For example, the beginnings of civic engagement in helping to form and maintain a national park in war-torn Afghanistan (Smallwood 2013), and examples of war veterans initiating hunting

[2] Illustrating how so-called 'natural disasters' can quickly take on characteristics of war zones, as many as 15,000 federal troops, National Guardsmen, and private contractors from Blackwater USA patrolled New Orleans in the wake of Katrina. For an overview of policing in post-Katrina New Orleans, see Deflem and Sutphin (2009) and for an over view of 'disaster as war' in post-Katrina New Orleans, see Tierney and Bevc (2007).

and fishing programmes to help their fellow soldiers heal from the scars of war (Krasny et al. 2013), and other examples (Fig. 3.1) all represent efforts that have emerged in response to conflict and disturbance, and that involve greening or other engagement in nature that integrates a community or civic, or in a few cases political, purpose.

3.3.2 Red Zones

The term 'red zone' has a history dating back to at least the first part of the Twentieth century. One of its first usages was in reference to the '*Zone rouge*' (French for Red Zone), the name given to 465 square miles of northeastern France that were destroyed during the First World War (Smith and Hill 1920). In more recent times, the term has been used to refer to unsafe areas in Iraq after the 2003 invasion of the US and its allies, the opposite of 'Green Zone,' a presumably more safe area in Iraq. The term was also used by journalist Steven Vincent,[3] as part of the title of his book *In the Red Zone: A Journey Into the Soul of Iraq* (2004) and has been used by others to describe lawless conditions such as those of the Rwandan genocide.[4]

An internet search for 'red zone' illuminates how the term is currently used in film and digital entertainment media to connote a war zone, a hostile zone, a contaminated zone, or a zone characterized by increased intensity and higher stakes, such as in the combative sport American football. The term has also been used to describe the disorientation phase in a second order learning process documented and conceptualized in a learning process model among adults (Taylor 1986). In this chapter, the term *red zone* is used to refer to multiple settings (spatial and temporal) that may be characterized as intense, potentially or recently hostile or dangerous, including those in post-disaster situations caused by geophysical disasters as well as those associated with terrorist attacks and war.

Within these red zones are people for whom the red zone represents a perturbation or disruption of their individual, family, and community patterns of living. For a herder in rural Afghanistan, a soldier occupying the herder's village, or a relief worker from an NGO, red zones represent both a time period and points on a landscape where linked ecological and social patterns are disturbed suddenly, drastically, and with little warning. These situations are referred to as *Stability, Security, Transition and Reconstruction* (SSTR) contexts by aid, diplomacy, and military organizations. According to the US Department of Defense (2005):

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[3] Vincent was tragically murdered in Basra, Iraq while reporting on the increasing infiltration of the Basra police force by Islamic extremists loyal to Muqtada al Sadr. See at: http://www.nytimes.com/2005/08/03/international/middleeast/03cnd-iraq.html?_r=1

[4] http://www.pbs.org/wgbh/pages/frontline/shows/ghosts/interviews/power.html

> …the immediate goal [in SSTR activities] is to provide the local populace with security, restore essential services, and meet humanitarian needs. The long-term goal is to help develop indigenous capacity for securing essential services, a viable market economy, rule of law, democratic institutions, and a robust civil society. Tasks include helping rebuild indigenous institutions including various types of security forces, correctional facilities, and judicial systems necessary to secure and stabilize the environment; reviving or building the private sector, including encouraging citizen-driven, bottom-up economic activity and constructing necessary infrastructure; and developing representative governmental institutions (pp. 2–3).

This chapter suggests that those involved in SSTR go beyond their usual strategies to consider the question: How might greening play a role alongside other interventions in transforming red zones so that they become more secure, provide essential services, and meet humanitarian needs? Raising this question is, then, a suggestion that providing resources and spaces for individuals and communities to engage in greening will contribute to a community's ability to adapt and transform in the face of violence and unrest and that providing opportunities for expressing this need to be in, and to steward, nature may contribute to stability and order post-conflict. But what mechanistic function or functions of this greening can be credited for such effects?

3.4 Mechanisms of Resilience and Other 'Re-Words': Community-Based Ecological Restoration

Due to a focus on outdoor recreation for returning combatants in the last few years,[5] a common theme has emerged among soldiers when discussing the value of their activities to their reintegration to peaceful society. This theme is the tripartite notion of recreation, reconnection and renewal. These three 're-words' are common in the discourse of urban ecology and related disciplines. These words, and many like them (see Fig. 3.2), are interesting because of what so many of them represent—they are 'do-over' words, words that indicate another opportunity, a second chance. They suggest alternate endings and outcomes, improved performance or satisfaction, a kind of optimism and hopefulness that a second chance means a better conclusion.

Interest in these re-words stems from the broader philosophical underpinnings of work on the notion of 'greening in the red zone.' Though in a direct sense this work is focused on how humans interact with nature in the midst of and in the aftermath of calamity, and how that interaction is a very important but underappreciated source of resilience and recovery, in a broader sense this work on nature

[5] This work in progress is funded by USDA Federal Formula Funds, under two projects: (1) 2011–2012–221: *Returning Warriors: A Study of the Social-Ecological Benefits of Coming Home to Nature*; and (2) 2013–2014–380: *Returning Warriors: Outdoor Recreation & Restoration for Resilience*.

reabsorb reaccede reaccelerate reaccent reaccept reaccession **reacclimatize** reaccredit reaccuse reacquaint reacquire react reactivate readapt readdress **readjust** readmission readopt readorn reaffirm reaffix reafforest reaggregate realign reallocate reanalyze reanimate reannex reanoint reappear reapply reappoint reapportion reappraise reappropriate reapprove reargue rearrange rearticulate reascend reassemble reassert reassess reassign reassure reattach reattempt reattribute reauthorize reavail reavow reawake rebalance **rebirth** reblend rebloom reboard rebook **reboot** rebound rebred rebuff rebuild rebuke rebury rebut rebutton rebuy recalculate recalibrate recall recant recap recast receive recertify recharge recheck reciprocate recirculate reclaim reclassify reclean recline recode recognize recolonize recolor recombine recommence recommission recommit recompile recompose recompute reconceive **reconcile** recondense reconfigure **reconnect** reconsecrate reconsider reconsolidate reconstitute reconstruct recontour reconvey reconvince recook recopy recork recoup **recover** recreate recross recrown recultivate recycle redecorate rededicate redeem redefine redeploy redevelop redigest redirect redistill reeducate reelect reembody **reemerge** reemphasize reenact reenergize reengineered reenlist reenroll reenter reestablish revaluate reexamine reexperience reexplore reexpose reface refasten refill refinance refinish refit reflect reflex refocus **reforest** reform ...

Fig. 3.2 So-called 're-words' often indicate another opportunity, a second chance

and green spaces in areas facing conflict, hazard and vulnerability is about playing a hunch. The hunch is that perhaps a key to this idea we are collectively chasing called *sustainability* is in essence a focused understanding of how our species remembers and reconstitutes relationships with the rest of nature when serious calamity occurs.

What can we learn about how humans relate and reconnect with nature in dire circumstances? And how can that learning about what we do in urgent circumstances be applied to longer term thinking about sustainability and resilience, especially in efforts to expand the notion of peace ecology?

In addressing these broader questions, it seems that this work is mostly about a kind of archaeology of the human social-ecological experience, trying to excavate and peel back the layers of history that have covered over our ecological identity. This is interesting because fundamentally many agree that our species faces very dark days indeed if we cannot remember our ecological identity and recover a peaceful relationship with the ecosystems upon which we depend. Given the challenges facing society and our planet, remembering and recovering our individual and collective ecological identity is of the utmost urgency. However, hopeless this endeavour feels in daily life, it is when we are faced with calamity that our withering ecological identity suddenly flushes and blooms, and becomes more clearly important to our survival.

Documentation and arguments that creation and access to green spaces promotes *individual* human health, especially in therapeutic contexts among those

suffering traumatic events have been presented elsewhere (Tidball and Krasny 2007). But what of the role of access to green space and the act of *creating and caring* for such places in promoting social health and well-being, at neighbourhood, community, and even city-wide scales, especially in SSTR contexts? The greening in the red zone project (Tidball and Krasny 2013a) asserts that creation and access to green spaces confers resilience and recovery in systems, from individual human systems to regional and landscape scale systems, which have been disrupted by violent conflict, crisis, or disaster. Evidence for this assertion are provided through cases and examples, using a variety of research and policy frameworks to explore how creation and access to green spaces in extreme situations might contribute to resistance, recovery, and resilience of social-ecological systems. What remains is to apply this explicitly to the domain of the linked notions of ecology and peace.

Fundamental to the greening in the red zone project is the argument put forward by Berkes and Folke (1998): systems that demonstrate resilience appear to have learned to recognize feedback, and therefore possess "*mechanisms* by which information from the environment can be received, processed, and interpreted" (Berkes and Folke 1998: 21, emphasis added). In this sense, these scholars go further than simply recognizing that people are part of ecological systems, but attempt to explore the means, or social *mechanisms*, that bring about the conditions needed for adaptation in the face of disturbance and other processes fundamental to social-ecological system resilience. One such social mechanism extensively documented by Berkes and colleagues is traditional ecological knowledge (Berkes 2004; Berkes et al. 2000; Berkes and Turner 2006; Davidson-Hunt and Berkes 2003; see also Shava et al. 2010). But what other social mechanisms might exist and how does one identify and describe these mechanisms in often urban post-conflict scenarios?

As a result of the greening in the red zone project, additional questions have arisen that must be addressed:

- What processes or mechanisms might explain the phenomena of greening in the red zone?
- Why do people turn to nature and green spaces as sources, sites, and systems of resilience and other re-words?

To date, the list of processes/mechanisms that might explain the emergence and persistence of greening in the red zone includes five processes:

(1) Urgent Biophilia
(2) Restorative Topophilia
(3) Memorialization Mechanisms
(4) Social-ecological Symbols and Social-ecological Rituals; and
(5) Discourses of Defiance.

A brief description of each of these mechanisms appears in the coming paragraphs, followed by a conclusion with some caveats and areas for future work. Each of these has been explored individually and presented elsewhere in a peer

MECHANISM/PROCESS	DESCRIPTION	CITATION
Urgent Biophilia	Relatively dormant or muted innate attractions to the rest of nature flood to the fore in the form of "urges" to "get back to nature" in crisis contexts.	Tidball, KG. 2012. Urgent Biophilia: Human-Nature Interactions and Biological Attractions in Disaster Resilience. Ecology and Society, 17(2).
Restorative Topophilia	Heightened awareness of place attachment that manifests itself in restoration and recovery of key elements, symbols, etc. that epitomize the "placeness" of a crisis affected area.	Tidball, KG & RC Stedman. 2013. Positive Dependency and Virtuous Cycles: From Resource Dependence to Resilience in Urban Social-Ecological Systems. *Ecological Economics* 86, 292-299.
Memorialization Mechanism	When spontaneous and collective memorialization of lost ones through gardening and tree planting occurs, a community of practice emerges to act upon and apply these memories to social learning about greening practices.	Tidball, KG, ME Krasny, E Svendsen, L Campbell, & K Helphand. 2010. Stewardship, Learning, and Memory in Disaster Resilience. "Resilience in Social-Ecological Systems: the Role of Learning and Education," *Environmental Education Research*, 16(5): 341-357.
Social-ecological Symbols & Social-ecological Rituals	Presence of tree symbols, the memories that define them and that inform the rituals that perpetuate them, and the resulting social-ecological relationships between people and trees or forests, as expressed through symbols and rituals.	Tidball, KG (2013). Trees and Rebirth: Social-Ecological Symbols, Rituals and Resilience in Post-Katrina New Orleans. In: Tidball and Krasny, Eds., *Greening in the Red Zone: Disaster, Resilience, and Community Greening*. NY: Springer.
Discourses of Defiance	Within crisis contexts, when some or all of the above processes are leveraged to become wider movements of resistance, recovery, and resilience, especially in the wake of news media or other information that portrays a group or community in an unfavorable light.	Tidball, KG, Svendsen, E, Campbell, L, Falxa-Raymond, N. (in preparation). Landscapes of Resilience and Discourses of Defiance: Greening as Recovery in Joplin and New York City.

Fig. 3.3 Processes and mechanisms theorized to explain why people turn to greening in crisis. *Source* The author

reviewed journal article or book chapter (see Fig. 3.3), so in this chapter will only be briefly described. The reader interested in more detail is encouraged to locate the sources in Fig. 3.3.

3.5 Urgent Biophilia

Perhaps the foundational mechanism, *urgent biophilia* (Tidball 2012b) is the affinity we humans have for the rest of nature, the process of remembering that attraction, and the urge to express it through creation of restorative environments, which may also restore or increase ecological function, and may confer resilience across multiple scales. So, when faced with violence as in prolonged conflict or war, as individuals and as communities and populations, we seek engagement with nature to summon and demonstrate resilience in the face of a crisis, we are demonstrating an urgent biophilia.

Urgent biophilia represents an important set of human-nature interactions in SES recently perturbed by violence, conflict, and war, often appearing in the 'backloop' of the adaptive cycle (Holling and Gunderson 2002; see Fig. 3.4).

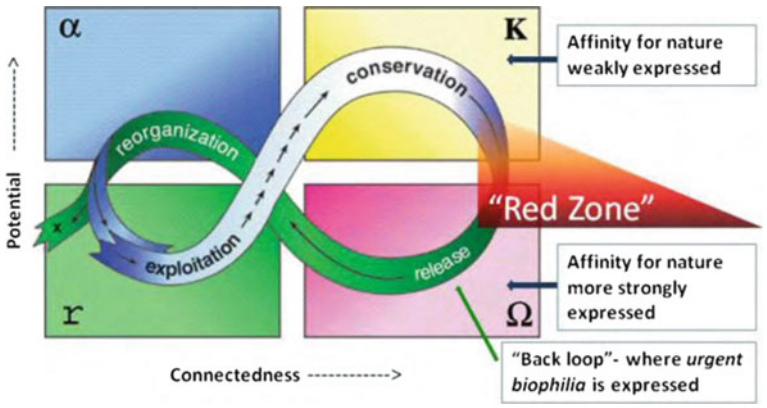

Fig. 3.4 The adaptive cycle, meant to be a tool for thought, focuses attention upon processes of destruction and reorganization, which are often neglected in favor of growth and conservation. In this adaptation, urgent biophilia is modeled. For more on the adaptive cycle, see the Resilience Alliance website; at: http://www.resiliencealliance.com/

Urgent biophilia builds upon contemporary work on principles of biological attraction (Agnati et al. 2009a; b) as well as earlier work on biophilia (Kellert 1997a, b; Kellert and Wilson 1993; Wilson 1984, 1993) while synthesizing literatures on restorative environments, community-based ecological restoration, and both community and social-ecological disaster resilience.

3.6 Restorative Topophilia

This mechanism is yin to the yang of urgent biophilia. Here, drawing upon Tuan's notion of topophilia (literally 'love of place'), the emphasis is on a social actor's attachment to place and the symbolic meanings that underlie this attachment. In contrast to urgent biophilia, *restorative topophilia* (Stedman and Ingalls 2013; Tidball 2012a; Tidball and Stedman 2013) is conceived and operationalized as more experiential and 'constructed' rather than innate, and suggests that topophilia serves as a powerful base for individual and collective actions that repair and/or enhance valued attributes of place. These restorative greening actions are based not only on attachment—people fight for the places they care about—but also on meanings, which define the kinds of places people are fighting for.

An important implication of the juxtaposition of urgent biophilia and restorative topophilia is the conceptualization of positive dependency. This idea suggests that purely-deficit based perspectives regarding conflict-ridden social-ecological systems and the human populations within them represent barriers to these systems' ability to move from undesirable system states into more desirable, sustainable ones. A characterization of issues such as individual ecological identity, human

exceptionalism and exemptionalism (Cairns 1999), anthropocentrism, and resource dependence is offered, in order to better examine notions found in the resource dependency literature, such as the roots of ideas about dependency. This literature is used as a springboard into the possibilities of an antipodal notion of resource dependency that may be applicable in SSTR contexts, named positive dependency.

Positive dependency as a concept allows us to escape the misguided conclusions potentially drawn by resource dependence arguments that the more that humans depend on natural resources, especially for tangible needs, the more those humans become vulnerable, the more their resilience is compromised. While attempting to recover or reconcile our relationship with nature, society may not need the contradictory message that "the less we are forced to depend upon nature, the better off we are" rattling around our heads. Rather, we can benefit by contributing to the evolution of resource dependency thinking to include the at once simple yet profound idea that "the more we acknowledge our dependence on nature, especially in urban contexts, the more resilient we can be". Two possible sources of positive dependency in conflict-laden social-ecological systems are suggested, the aforementioned urgent biophilia and restorative topophilia. An important conclusion is the recognition of positive dependency as a precursor to the development of a heightened sense of ecological self and sense of ecological place in social-ecological systems perturbed by violence and war. However, contested meanings over symbols of place, and contested territories themselves, can complicate and even frustrate positive dependency, as is seen in the territorial disputes between Israelis and Palestinians (Fig. 3.5).

Fig. 3.5 Three examples of trees representing social-ecological symbols that can be deployed for expression of urgent biophilia, restorative topophilia, and memorialization **a** live oak trees like these in New Orleans were destroyed by Hurricane Katrina and replanted afterwards as a way to express a need to reconnect with nature; **b** Israel's West Bank along the Dead Sea, palms have multiple contested meanings and can be planted or destroyed in efforts to recreate or redefine place meanings, and **c** Hiroshima, Japan, trees that survived the A-bomb are used to memorialize lost human lives and to serve as symbols for a peaceful future. *Source* Photos by Keith G. Tidball

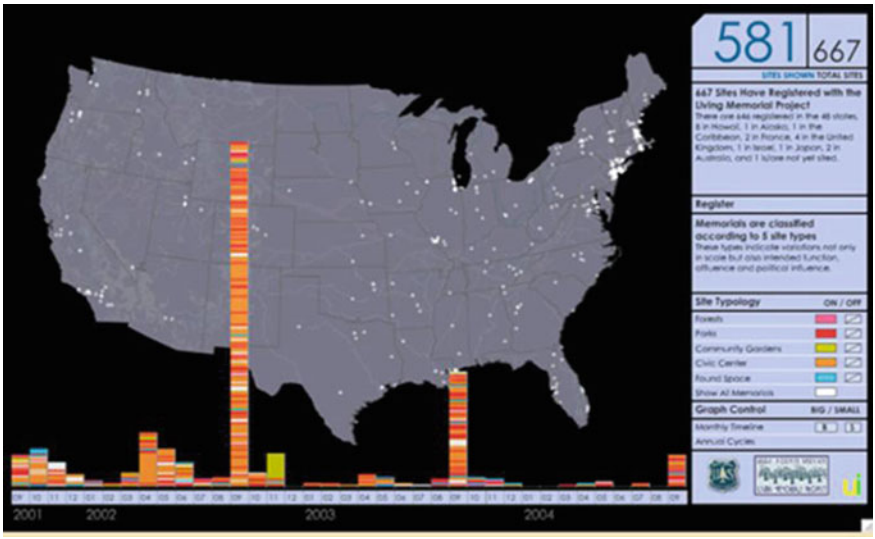

Fig. 3.6 The USDA Forest Service project Living Memorials illustrates the power of the memorialization mechanism. This map depicts Living Memorial sites memorializing the terrorist attacks of 9/11 across the U.S. *Source* Image courtesy of US Forest Service Living Memorials Project

3.7 Memorialization Mechanisms

A greening *memorialization mechanism* (Tidball et al. 2010) begins right after a crisis, when spontaneous and collective memorialization of lost family members or community members through gardening, tree planting, or other civic ecology (Krasny/Tidball 2012; Tidball and Krasny 2007) practices happens. Then a community of practice emerges to act upon and apply these memories to social learning about greening practices. This, in turn, may lead to new kinds of learning, including about collective efficacy and ecosystem services production, through feedback between remembering, learning, and enhancing individual, social, and environmental well-being (Fig. 3.6).

3.8 Social-Ecological Symbols and Social-Ecological Rituals

Social-ecological rituals can be understood as storehouses of meaningful symbols by which information is revealed and regarded as authoritative, as dealing with the crucial values of the community (Turner/International African Institute 1968: 2; Deflem 1991). Returning to the example of post-Katrina New Orleans,

reforestation activities emerged as rituals by which information that represented a counter-narrative to news media and others who spoke of New Orleans' episodes of unrest after the hurricane as a 'city gone feral,' a 'failure of resilience,' a 'snakepit of lawlessness and anarchy' (see Tierney et al. 2006) was revealed and regarded as authoritative (Tidball 2013). Post-Katrina reforestation rituals acted as storehouses of multiple meaningful tree symbols dealing with crucial community values and concepts such as place attachment and sense of place, resilience and resistance, hope and commitment, and survival and stability.

But tree planting rituals and the social–ecological symbols contained in them reveal more than crucial social values. They are also transformative for human attitudes and behaviour, and therefore the handling of tree symbols in ritual exposes the power of tree symbols to act upon and change the persons involved in ritual performance. Whereas New Orleans residents, in efforts to resist being labeled a 'feral city' (Norton 2003), may have been attracted to tree symbols and rituals' as a result of the operation of urgent biophilia, restorative topophilia, positive dependency, biological impulses combined with socio-cultural phenomena, for instance, recalling social-ecological memories (Barthel et al. 2010), involvement in memorialization mechanisms, or the clear connection of trees to notions of stability and re-birth, research in New Orleans suggests that subsequent participation in tree planting rituals appeared to change the persons involved such

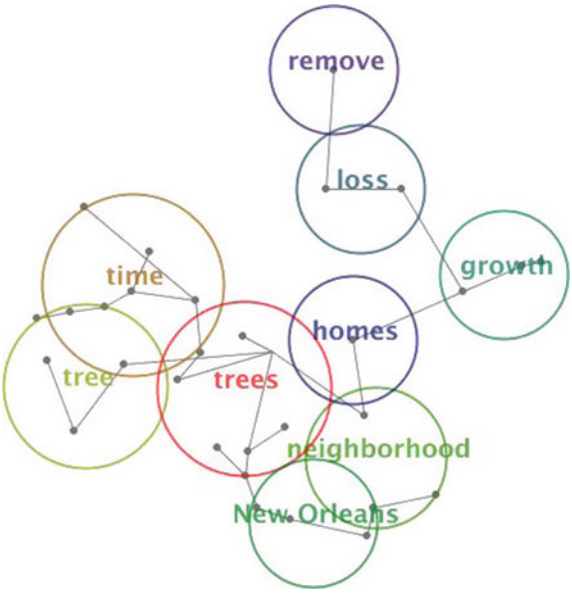

Fig. 3.7 Graphic depiction of concepts, themes, connectivity, and relevance from research in New Orleans from 2006 to 2012. Note the closeness of concepts of trees and tree with New Orleans, homes, and neighbourhood, indicating strong symbolic significance in trees and ideas of place. *Source* The author

that they experienced renewed hope, optimism, and sense of commitment to their neighbourhood and to their city, important indicators of community resilience (Tidball 2012a) (Fig. 3.7).

New Orleans residents organized around a particular area of knowledge and activity (trees and tree planting) and developed or reconstituted rituals and symbols that at once reinforced and reinvented the accumulated knowledge of the community via a distributed community of practice centered on trees and tree planting after Katrina. This contributed to enhancing a sense of joint enterprise and identity, and therefore contributed to the resilience of the New Orleans social-ecological system. New Orleans residents also continue to plant and steward trees, directly adding to the biomass, future urban tree canopy, and the potential capacity of the urban social-ecological system to produce critical ecosystem services. In so doing tree symbols, tree planting rituals, and those involved in them simultaneously present both a source of and a demonstration of individual, community, and social-ecological system resilience. Trees as symbols are especially common in red zone areas throughout the world (Fig. 3.8).

3.9 Discourses of Defiance

As discussed in the above section describing the importance of tree symbols and tree rituals as counter–narratives, the *discourses of defiance* mechanism is focused specifically on the importance of the use of social-ecological symbols and rituals, memorialization, restorative topophilia, and urgent biophilia to resist or reshape the conversation about where one resides and the people living there. This mechanism was first explored in research conducted in New Orleans, as residents resisted initial discourses promulgated by the news media essentially 'writing off' New Orleans as a failed, or worse, feral city. Residents used many of the mechanisms above to reframe the discourse to reflect a more hopeful, more optimistic, recovery and rebirth oriented conversation.

But like most of the mechanisms described, there is a potential dark side to discourses of defiance. There are examples of symbols such as trees and forests and their planting or removal being used for less than benevolent purposes or contributing *to* red zones rather than ameliorating them (Cronon 2003; Fairhead and Leach 1996; Guha1989; Prudham 2004; Scott 1998). For the purposes of this chapter, perhaps a most salient example exists in the Israel/Palestine territorial conflict. Here, according to Braverman (2009) there are two dominant and highly symbolic tree landscapes; pine forests and olive groves. The pine tree is associated with Zionist afforestation of the Promised Land, while the olive tree symbolizes the long agricultural connection to the land held by Palestinians (Braverman 2009). Braverman describes in great depth the story of trees through the narratives of military and government officials, architects, lawyers, Palestinian and Israeli farmers, and Jewish settlers, including cases of trees actually being targeted by

Symbol Family/Type	Gen. Category of Symbolic Meaning	Value	Occurrence
Trees	survival, stability, strength, longevity	Positive (P)	27
	sense of place icons	P	22
	hope, commitment, future	P	16
	life & growth	P	11
	memorials	P	6
	sign of return to normalcy	P	5
	therapy	P	4
	rescuer or refuge	P	2
	visual communication	P	n/a
	removal =punishment/penalty/taking	Negative (N)	16
	damaged =injury/wound/brokenness	N	11
	fallen down = damage/tragedy/loss	N	5
	falling = fear/terror danger/death	N	3
Tree planting	public service	P	18
	commitment to future	P	15
	means of beautifying	P	13
Trees & tree planting	improving environment	P	14
	positive impact on landscape	P	8
	educational	P	6
	Liability, risk, hazard, gentrification	N	5

Fig. 3.8 Multiple symbolic meanings of trees in different contexts derived from interview data in post-Katrina New Orleans. The chart depicts three broad families of symbolic meanings of trees: (A) trees themselves as symbols (their presence, their absence, their status); (B) tree planting as a kind of symbol or symbolic action; and (C) both trees and tree planting explicitly combined in the discourse. The presence of tree symbols, the social-ecological memories that define them and that inform the rituals that perpetuate them, and the resulting social-ecological relationships between people and trees or forests, as expressed through symbols and rituals, reveals a possible mechanism within the greening in the red zone system, and a source of resilience in this kind of urban social-ecological system undergoing rapid change. *Source* The author

military forces, removed, and destroyed, in some cases repeatedly. In cases such as this, the discourses of defiance as mechanisms may in fact contribute to conflict rather than serve as sources of resilience and peaceful transitions.

3.10 Conclusion

A growing network of social and ecological scientists argue that change is to be expected and planned for, and that identifying sources and mechanisms of resilience in the face of change is crucial to the long-term well-being of humans, their communities, and the local environment (Elmqvist et al. 2013). Yet, as has been pointed out elsewhere, several gaps in the resilience literature persist, including (1) a lack of studies focused on cultural systems (Wright/and Masten 2005), (2) relatively few studies that explicitly re-embed humans in ecosystems, and (3) a need for more studies that integrate the theory and science of individual human resilience with broader ecological systems theory and research exemplified by social-ecological systems resilience scholarship (Masten/Obradovic 2008). In introducing the reader to the five mechanisms above, this chapter has outlined an attempt to address these gaps, and to further efforts to utilize community-based ecological restoration to enhance resilience and transitions toward peace, by asking two fundamental questions.

The questions raised were: What processes or *mechanisms* might explain the phenomena of greening in the red zone? How might community-based ecological restoration enhance resilience and transitions toward peace? These questions allude to application in planning and policy making fields, in natural resource management, and in fields dealing with Stability, Security, Transition and Reconstruction. Both questions belie a desire to conceptualize human systems as nested within ecological systems, and therefore human resilience as nested within ecological resilience, especially at the nexus of peace, ecology, and resilience. The first efforts at answers to these questions seem to be timely given continuing worries about conflict over access to resources, climate change, and overpopulation and the red zones that will inevitably emerge. The ways in which we as humans reorganize, learn, recover and demonstrate resilience through remembering and operationalizing the value of our relationships with elements of our shared ecologies in the direst of circumstances such as disaster and war hold clues to how we might increase human resilience to new surprises, while contributing sources of social-ecological resilience to ecosystems. This would seem to be an important future direction for ecology and peace research. In conclusion, and returning to the questions raised by Weinthal (2004) earlier, this chapter argues that, firstly, indeed, there *are* other environmental resources also positioned to foster peace, and that these can be found in the many greening activities engaged in by the rank and file residents resolutely attempting to return their lives to 'normal' in the wake of calamity. Trees, gardens, parks, landscapes, and the creatures moving about within them are important, but so often overlooked, environmental resources that point to sources and mechanisms of resilience.

Secondly, Weinthal's (2004) suggestion of a focus on lower levels of analysis is a wise one. Not only were most of the security threats that emerged in the 1990s intrastate threats, the first and a good portion of the second decades of the 2000s have been characterized by security threats of an asymmetrical nature and lacking

a defined front or forward edge of the battle area. Could we, as Weinthal asks, use the environment as a peacemaking tool within states and along tenuous border regions? Again, this chapter suggests that, given the overlooked and largely untapped social-ecological resources available as repositories of resilience and mechanisms that bring about the conditions needed for adaptation in the face of disturbance, not just the environment as a setting, but *engagement with the environment* shows great promise as a peacemaking tool in intrastate contexts and in territorial disputes.

Finally, this chapter's suggestion that community-based ecological restoration might enhance resilience and transitions toward peace seems to give great support to Weinthal's (2004) observation that the environment might be thought of as more than solely a mechanism to mitigate hostilities and therefore bring about peace. It might also offer opportunities in post conflict resolution to *sustain* a fragile peace and prevent a return to violence. The many examples offered of greening in the red zone, and the specific processes and mechanisms that might explain the emergence and persistence of greening in the red zone described herein, would appear to assist in bringing into focus a future trajectory for peace ecology, that being to encourage and convince (via empirical research and sound theory) researchers, policymakers, and practitioners to move beyond simply conflict scenarios and environmental peacemaking towards Weinthal's notion of environmental peacekeeping.

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Chapter 4
Social and Environmental Vulnerability in a River Basin of Mexico

Úrsula Oswald Spring

Abstract Given the paralysis in global multilateral environmental negotiations and a lack of determination among the heads of states and governments of both the G8 and the G20 countries, alternative strategies, policies and measures towards a sustainability transition are proposed that actively involve civil society and the economic sector. Starting with general questions related to global environmental change, the chapter goes on to address the following questions: what are the real necessities for the Earth and for world society as a whole, especially for the socially vulnerable, and how can poor people living in a high-risk water basin and affected by climate change develop sustainable alternatives to deal with social and environmental vulnerability? A second question is how ethically committed scientists could support these bottom-up efforts to research and advise about the complex interactions existing between the natural and the human systems. The chapter first presents a conceptual argument concerning a double vulnerability. Later both environmental and social vulnerabilities are investigated in a river basin in Mexico greatly affected by climate change due to glacier melting on Popocatépetl, flash floods, droughts, urbanization, land use changes without urban planning, inadequate productive and waste management, overuse of water and social marginalization, especially for young people and the elderly. The next section deals with the description of the arena of conflict in this basin where water pollution and scarcity, land use changes related to chaotic urbanization and survival dilemmas caused by the desertification of rural areas are triggered by organized crime, pushing communities and family members towards migration.

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However, the global financial crisis, the lack of a counter-cyclical policy in the Mexican government and the migration policy of the USA have placed limits on international migration as a possible adaptation process, often bringing people to the edge of survival. This means that changes and adaptation are complex phenomena understood very differently in scientific disciplines and by the people affected.

Keywords Adaptation · Coping strategies · Disaster risk reduction · Droughts · Environmental vulnerability · Flash floods · Global environmental change · Resilience · Social vulnerability · Yautepec River Basin

4.1 Introduction

Since 2009, the *Conference of the Parties* (COP) of the *United Nations Framework Convention on Climate Change* (UNFCCC) has failed to adopt any legally binding agreement on reducing *greenhouse gas emissions* (GHG). At Rio +20 in June 2012, no new legal obligations were approved at the three Rio conventions (UNFCCC, CBD, UNCCD) pertaining to threatened ecosystem services and the reduction of the over-exploitation of natural resources. Simultaneously, at the VIIth G20 Leaders' Summit in Los Cabos, Mexico, "the IMF's financial resources were increased to over $450 billion USD" in order to expand the IMF's capacity to cope with the global economic crises. However, on global environmental change only verbal declarations were made on the subject of launching a "Dialogue Platform on Inclusive Green Investments" that would identify "private investment opportunities in green projects".[1] Given the paralysis of the global multilateral environmental negotiations since the economic crisis (2008) and the lack of determination among the heads of states and governments of both the G8 and G20 countries, there is an urgent need to pursue alternative strategies, policies and measures towards a transition towards sustainability by civil society and the economic sector.

To achieve this goal it is important at the global level to understand what is driving the priority given to supporting a crumbling financial system (Stiglitz 2002, 2006; Soros 2002) instead of saving the planet and creating a stable basis for the lives and livelihoods of the most vulnerable. What are the Earth's real necessities, and what are the crucial questions for world society as a whole and especially for the socially vulnerable, and how are people affected at the local level?

[1] See press release by President Calderón, Los Cabos, Mexico, 19th June 2012: "The VII G20 Leaders' Summit Concludes"; at: http://www.g20mexico.org/index.php/en/press-releases/460-concluye-la-vii-cumbre-de-lideres-del-g20.

Given these global questions, this chapter examines what is policy-relevant for a special region that is highly affected by *global environmental change*[2] (GEC). The aim is to reduce the risks faced by those people who are most threatened by both environmental and social vulnerability. This chapter addresses the research question of how poor people who are living in a high-risk river basin in Mexico and who are affected by (GEC) can develop coping strategies to overcome both social and environmental vulnerability.

The chapter is divided into six parts. After this introduction the next part introduces the concept of environmental and social vulnerability (Sect. 4.2), the research area and the research methodology (Sect. 4.3). Then both vulnerabilities are investigated in the Yautepec River Basin (Sect. 4.4) in Mexico, a region highly affected by GEC due to human activities. To cope with these environmental and social challenges people are developing bottom-up and top-down strategies (Sect. 4.5), while the conclusions offer a proposal for sustainable management of this high-risk river basin from a gender perspective (Sect. 4.6).

4.2 Environmental and Social Vulnerability: A Double Vulnerability

This chapter uses the concept of double vulnerability as an analytical tool for empirical analysis and assessment (Fig. 4.1). *Environmental vulnerability* is related to pollution and water shortages aggravated by climate variability where rapid-onset extreme hydrometeorological events (flash floods, cyclones) and medium-term (drought, erosion) and long-term (desertification) processes aggravate fragile soil conditions in areas of steep slopes and stony and shallow layers with a superficial horizon of fertility.

Regarding *social vulnerability*, pressures are caused by globalization impact on a social environment characterized by poverty, insecurity, gender discrimination, hunger, obesity, disease and lack of resources. This double pressure is aggravated

[2] *Global environmental change* (GEC) is more than climate change. GEC includes the interaction between natural and anthropogenic factors. GEC is caused by human beings using anthropogenic nitrogen for crop fertilization and toxic pesticides, lixiviated and percolated into rivers, soil, aquifers and seas. The intensive use of fossil carbon has altered the chemical composition of the atmosphere and the climate with an anthropogenic increase in temperature; change of precipitation patterns; melting of glaciers, permafrost, Arctic and Antarctic ice shields; sea level rise; stronger cyclones and longer and more intensive droughts; and more intense extreme weather events affecting humans, productive processes and infrastructure. But in addition regressive globalization (Held/McGrew 2007), the financial crisis, and a high concentration of wealth in a few hands through speculation and financial management (Stiglitz 2002) have increased poverty and hunger, and these have been aggravated by high population growth. Finally, unsustainable productive processes with GHG emissions and waste of natural resources have increased the pollution of air, soil and water, directly affecting biodiversity and ecosystem services. For this reason, in the text we refer to GEC as including CC.

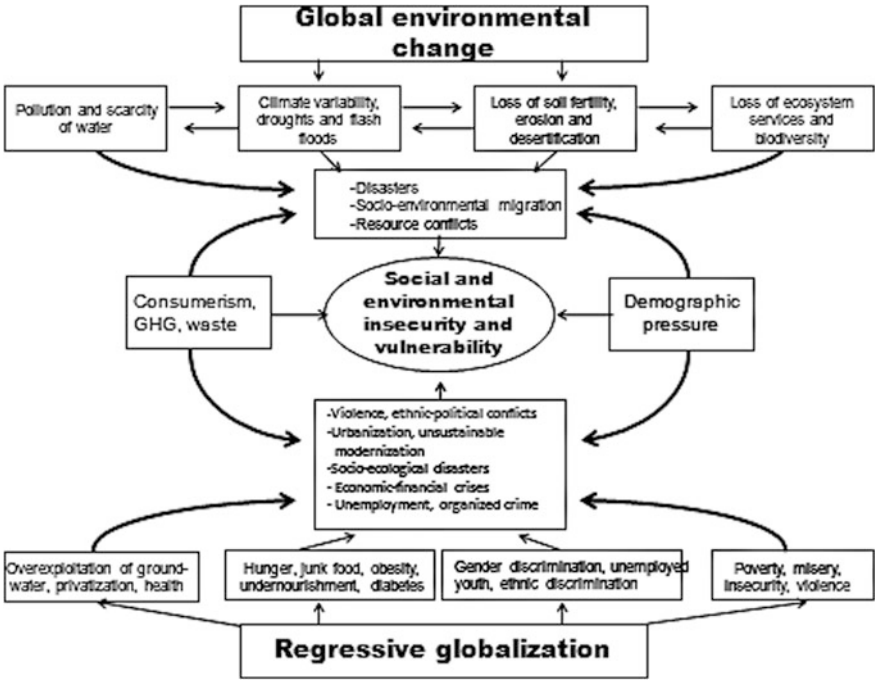

Fig. 4.1 Double environmental and social vulnerability. *Source* Oswald Spring, adapted from Bohle (2002)

by demographic growth and a wasteful consumerism where natural and social factors interlink, creating disasters, migration, resource conflicts, unemployment and violence that threaten human, gender and environmental security (HUGE; Oswald Spring 2008, 2009).

4.3 Research Area and Methodology

4.3.1 Research Area

The research focuses on a river basin in the central part of Mexico (Fig. 4.2) and covers four municipalities in the state of Mexico, nine in Morelos, and a small mountain part of Mexico City. The *Yautepec River Basin* (YRB) originates on the glacier of Popocatépetl (5,452 m) in the state of Mexico and receives dozens of tributaries and springs from the neovolcanic axis. Popocatépetl limits the watershed towards the east and Chichinautzin (3,476 m) the western part of the basin of the metropolitan valley of Mexico City. A third watershed running from the Tepozteco National Park, together with dozens of small intermittent tributaries,

Fig. 4.2 Location of the research area. *Source* The author

converges in the flood plain of Yautepec. All these rivers recharge the aquifer of the YRB, creating the *metropolitan zone of Cuautla* (MZC), which is the second largest economic zone in the state of Morelos. The whole basin covers an area of 1,249 km^2 with a population of almost 300,000 in 2013.

The two majestic volcanoes of Popocatépetl and Chichinautzin belong to the forest ecosystems of pine and oak, while the southern region is covered with tropical dry forest, stretching from the lower part of the volcanoes (Tepoztlan) to the Sierra Madre del Sur. The central valley in between has deep fertile soils produced by the erosion of volcanic sediments. In both ecosystems large areas have been protected because of their exceptional biodiversity (Fig. 4.3). Between these volcanoes, mountains and hills is the central valley. For more than a 1,000 years indigenous communities (Xochimilcas and Tlahuicas) have developed irrigation agriculture producing corn, cotton, chillies, beans, tomatoes and other important food crops and fruits (Maldonado Jiménez 1990; Mentz 2008). They produced several harvests a year because of the favourable climate and the monsoon.

After the Spaniards occupied this land they transformed this fertile valley into sugar cane plantations, taking away the irrigated land from the indigenous people. Expulsion from the fertile land, the over-exploitation of indigenous communities by the conquerors, and the creation of a monopolist hacienda structure of sugar cane industries meant that this region was actively involved both in the struggle for independence (1810–1812) and in the revolution (1910–1920). Emiliano Zapata, the leading general of the south, was born and killed in this sugar cane region. Future tendencies to population growth are estimated to be located basically in the metropolitan area of Cuernavaca and in the high plateau of the northern part of the YRB (Fig. 4.4; Partida Bush 2007; Aguilar et al. 2000).

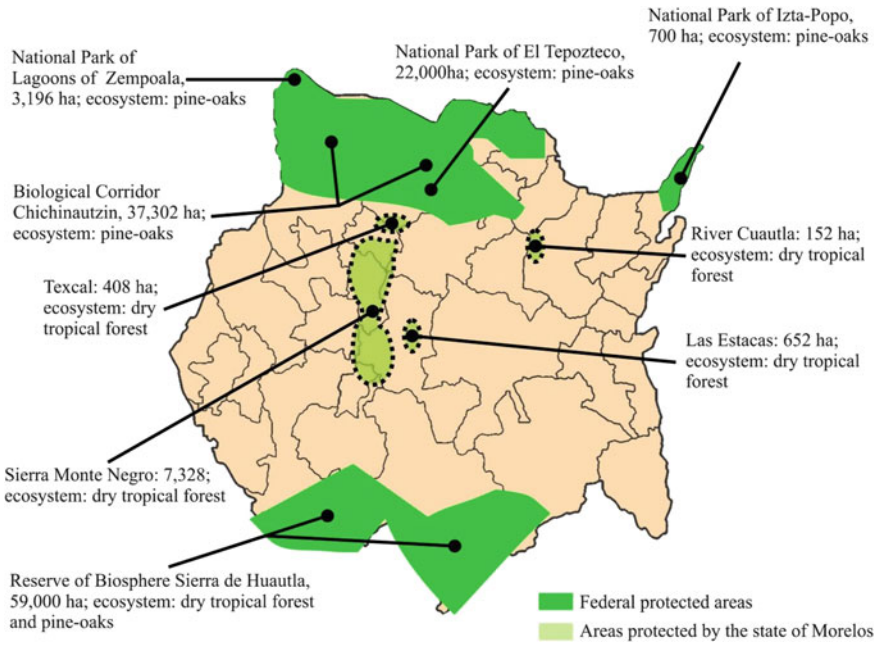

Fig. 4.3 National parks protected by the federal and state governments. *Source* The author

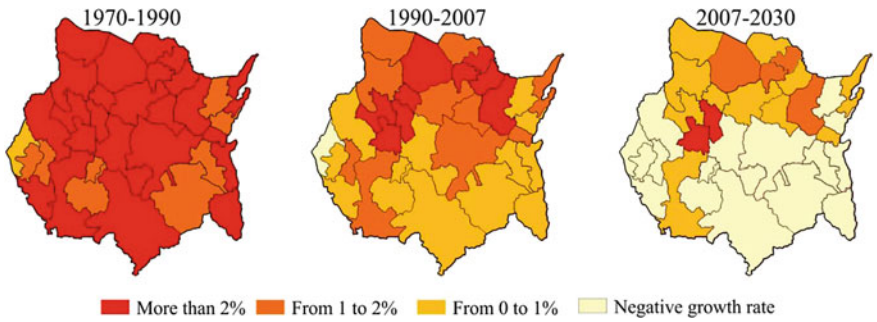

Fig. 4.4 Rate of population growth and urbanization for different periods in the state of Morelos in Mexico. *Source* Partida Bush (2007, p. 17)

4.3.2 Research Methodology

The research used both quantitative and qualitative methods. The quantitative approach includes databanks of official statistics, maps, satellite images and a survey that involved 3,955 people representing 1,019 households (Table 4.1). The survey is a random sample and is representative of the dynamic in the whole basin.

Table 4.1 Sample of the survey in the Yautepec River Basin

Phases of survey	People	Families	Women as %
First phase	1,440	385	49
Second phase	2,515	634	51
Total	3,955	1,019	50

Source Survey conducted by CRIM–UNAM (2010–2012)

It was undertaken between March 2010 and April 2011. During this period and in 2012 different qualitative field methods were applied in subregional settings taking urban and rural differences into account.

The qualitative methodologies facilitated the interpretation of the research results with deep-level interviews involving local leaders, politicians and key persons in the communities within the basin, anthropological participative observation, focus group discussions, a participatory rural survey, and analyses of local social movements. Regional studies compared the adaptation processes and resilience-building of different communities facing similar environmental and social threats. The research was divided into three phases over 3 years. (a) In the first year the research team carried out bibliographic studies and examined statistical series of production and demographic data, monographs and regional or local diagnoses related to the research questions. This phase included official databanks as well as local, state, national and international databanks concerning ecosystems and their transformation. These data were systematized in maps and complemented by aerial photographs, satellite images and field trips. A permanent seminar with the participants of the project integrated the different methodologies and clarified the research objectives. (b) In the second year a survey was conducted with closed and some semi-open questions, together with qualitative interviews with key informants and the recording of the life histories of families with migrants. In this phase we also analysed the transformation of the territory and the natural conditions (water, soil quality, erosion, biodiversity loss, land use change, ecological reserves) and public and private investment in the basin. Urban, environmental, agricultural, educational, and public health policies supplemented these data. In-depth interviews were conducted with political, industrial, religious and water authorities. (c) In the third year, special studies of the physical deterioration of the land, local urban planning and agricultural pilot projects were conducted and changes in the epidemiological profiles were mapped. Using focus groups, the productive coping strategies of small rural farmers, feminization of agricultural production, migration processes, transformation of crops and economic strategies to cope with lack of water, together with social participation in public activities and symbolic representations, were investigated. Local workshops promoted organic farming practices among the affected farmers. The information was included in a general map which visualized the vulnerability and socio-environmental complexity of the region and which has helped to mobilize people in the Yautepec River Basin to improve their resilience.

4.4 Double Vulnerability in the Yautepec River Basin: Disasters, Threats, Marginalization and Poverty

4.4.1 Environmental Vulnerability

The geological conditions of this river basin are related to the high volcanoes where extreme events are triggered by GEC, marginalization, institutional discrimination (Oswald Spring 2011b), and poverty. GEC is seriously affecting this river basin due to the melting of glaciers,[3] the variability of precipitation, a later monsoon with altered interestival drought periods[4] (Taboada Salgado 2005), deforestation, and increasing population. Conagua, the national water commission of Mexico, has also noted a reduction of average rainfall by 8 % during the last two decades, along with more flash floods. Together with longer dry periods the alteration in climate is affecting the fragile ecosystem of the dry tropical forest and its biodiversity, which all depend on a regular monsoon. Small farmers living from rain-fed agriculture need to be able to predict the monsoon in order to produce their subsistence crops.

Particular attention was given to the increasing frequency and intensity of flash floods in the basin. The first important flood, with 13 casualties, occurred on 25 August 1985 and caught the population totally unprepared. Even the oldest people could not remember a similarly intensive event in their lifetime. The next major disaster occurred during a Niño year on 28 September 1998. It was then that people took note of the danger posed by the river for the growing urban population and its economic activities. The next flood was in September 2003, then on 17 August 2010, and the most serious flood took place on 25 August 2010.[5] Since 2010, there has been at least one flash flood each year, together with longer dry periods, which have affected water availability and reduced the harvest of sugar cane and of other commercial and subsistence crops.

There are not only water-related disasters, but also water-borne illnesses. In 1992 the whole region, especially the town of Cuautla, was affected by a cholera epidemic when sewage water polluted the drinking water pipes. The emergency was only brought under control after several weeks with dozens of fatalities and thousands of sick people. Cysticercosis is endemic in the region. The increase of temperature and the use of plastic have also increased dengue fever, and the rate of dengue among people in the basin rose from 2005 to 2012 by more than 600 %,

[3] The glacier is further affected by periodic explosions and expulsion of incandescent pyroclastic materials from the dome of the active Popocatépetl.

[4] Also called midsummer drought, this phenomenon normally occurs during 2 weeks in mid-August and permits the corn plant to develop cobs. Later the rain starts again, permitting the full development of the plant.

[5] On 23 August 2011, the river basin, with a capacity of 195 m^3/s, was flooded by more than 400 m^3/s of water. At the entrance to the town of Yautepec, which is in a canyon, the river rose by 21 m in less than half an hour.

Table 4.2 Land use change in the state of Morelos 1977–1994

Land-use changes	1977 (ha)	1994 (ha)	2000 (ha)
Agriculture	185,799	210,251	287,362
Forest	232,774	197,805	151,868
Livestock	67,044	71,552	197,000
Urban areas	7,690	15,380	18,563
Water bodies	793	834	1,085

Source Rueda Hurtado (2006, p. 161) and INEGI (2000)

including the dangerous haemorrhagic dengue. In January 2013, the state health department reported 5,016 cases, mostly in the study region.

Nevertheless, these so-called natural disasters are not only climate-induced but also triggered by anthropogenic factors, such as land use changes, deforestation in both ecosystems, and the erosion of slopes in the mountain region. Table 4.2 indicates the land-use change in the state of Morelos, which is representative also for this basin area that covers 25 % of the state of Morelos. Forests were destroyed, especially the dry tropical forest in the central valley, and land-use change occurred, first for agricultural production and from 2000 on for the extension of urban and suburban metropolitan areas. Today the Canyon of Lobos is linked to the metropolitan area of Cuernavaca (Fig. 4.4), separated only by the protected area of the Sierra Montenegro (Fig. 4.3). Nevertheless, this central natural protected area together with El Texcal is under high social pressure and permanently threatened due to illegal land invasion and destruction of the remaining dry tropical forest.

El Texcal is crucial for the environmental equilibrium of the whole state of Morelos, because this natural park also represents the water reserve for the state (Bendig 2005). Land-use change and pollution of the water reservoir are creating threats for basic ecosystem services such as clean water and air, as well as for pollination processes. The demand for water is limited in the northern part due to its lack of water during the dry period. This creates conflicts between communities, but also between the traditional use of water for agriculture and the new demand for aquatic parks and spas.

Figure 4.5 shows that in the basin half of the surface is used for agriculture, while deforestation has caused almost 89 % of the area to deteriorate. Only 11 % of the original forests and dry tropical jungle have been conserved, due to the high population density in the region, an intensive use of soil for agriculture, and the changes from agricultural use to urban use and weekend houses. Both processes have affected the natural conditions. Together with erosion, deforestation and pollution, natural vulnerabilities have increased (Oswald Spring/Jaramillo 2012), with negative outcomes for the people and thus increasing their social vulnerability. Greater climate variability related to global processes but with local impacts can be observed in agricultural production. While in 2004 13,000 ha of rain-fed land were cultivated, in 2009 the total area fell to 10,000 ha and in 2012 to less than 9,000 ha, figures basically related to the emigration of subsistence farmers and the lack of rain

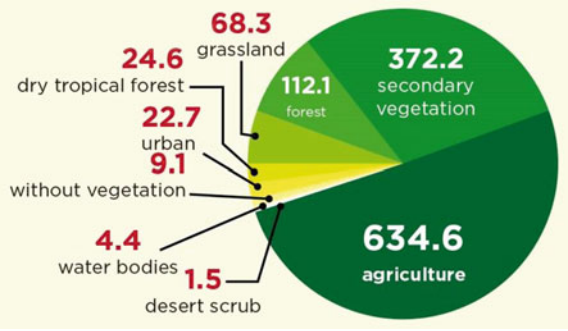

Fig. 4.5 Land-use changes in the Yautepec River Basin (in ha). *Source* Survey conducted by CRIM–UNAM (2010–2012)

for cultivation. The irrigated areas remained constant at 43,000 ha. Many peasant families who and the lack of rain for cultivation depend on the monsoon in the rain-fed land have decided to abandon their plots and migrate as their survival was threatened by periodic droughts and flash floods, where they lost not only their annual harvest but also the seeds for the next year (Oswald Spring et al. 2013).

Within the basin, water consumption is unequal: agriculture uses 95 % of the surface water and 23 % of groundwater, and less for livestock. Sugar cane production and increasingly the production of vegetables employ 16 % of the *economically active population* (EAP) in the basin, but produce only 4 % of the *gross domestic product* (GDP). The industrial sector employs 26 % of the EAP and produces 34 % of the GDP, while the service sector employs 58 % of the EAP and generates 62 % of the regional income. In terms of water use, secondary services use 3 % of surface water and 7 % of groundwater, while the service sector receives 3 % of the water from the rivers and 2 % of the groundwater. Household supply accounts for 67 % of groundwater and only 2 % from surface water in the highlands. The people in the highlands harvest rainwater and during the dry period they buy from water tanks. After the cholera epidemic the use of bottled water was introduced and today 72 % of the people buy their water in jugs, 12 % harvest it from rainwater and 15 % rely on their own well. The imbalance between water use, wealth generation and employment indicates a structural imbalance between water supply, demand and income, and therefore social and political tensions are related to the supply of, access to and availability of water.

Thus the arena of conflict over water supply and disasters in the YRB is historically related to its very specific geological and historical conditions—conditions that are socially aggravated. The permanent tributaries of the YRB originate at more than 5,452 m above sea level on Popocatépetl, on Chichinautzin and in the Tepozteco National Park (Aldama/Arreguín 2003; Aguilar Benítez 1999; Aguilar Benítez et al. 2000). The difference in altitude from Popocatépetl to the flood plain of the YRB, 4,200 m in 27 km, increases the velocity of the water, transporting rocks, waste and trees. These structural conditions have created

processes of *longue durée* forming a complex hydrology with numerous small rivers, often dried out and eroded during the dry season (Braudel 1949) where the *structural development of middle-term* processes is related to deforestation (including the national parks), soil erosion in 80 % of the surface area, a high level of sedimentation in the river bed, and invasion of the basin. The lack of municipal planning and infrastructure has created a vulnerable environment. When a rapid-onset event occurs, such as extreme rainfall, flash floods, or longer periods of drought, the most vulnerable people are deprived of their precarious conditions for survival (Oswald Spring et al. 2013).

From a longer-term perspective, these rivers have flowed into the floodplain, the Yautepec valley, and alluvial sedimentation has accumulated deep soils with high fertility. From ancient times, indigenous cultures—Tlahuicas and Xochimilcos—have developed a sophisticated irrigation system (Mentz 2008; Maldonado Jiménez 1990; Morett Alatorre et al. 2001), facilitating during the dry season several harvests per year, due to the mild subtropical climate. For this reason, the region has been densely populated for centuries and control of it has been taken over several times, first by indigenous groups,[6] later by the Spaniards, and today by urban landlords.

With the Spanish, the 'white gold' brought wealth to a small group of landowners (including the conqueror Cortez), while the indigenous farm workers were exploited and expelled from their land. They have also often lost their means of subsistence, resulting in great inequality and armed struggles. After the revolution, the land was distributed among the peasants, though women were excluded from the benefits, provided that they had actively participated in the war (Sosenski 2009; López González 1980; Meyer 1992). Slowly the land again became concentrated in the hands of landowners, including the urban bourgeoisie, and peasants often do not have enough income to survive from their small plots of land; this has increased the precarious conditions of life in the rural areas (Bartra 2012; García Jiménez 2005).

In the mountain region, inappropriate use of the soil, extensive pastures for livestock in dry tropical forest and over-fertilization have eroded the land. Furthermore, the distribution of small plots of land among numerous male descendants has produced small individual holdings, often resulting in the over-exploitation of these tiny plots of land. All these processes have increased the loss of natural fertility, as well as erosion and desertification, and this has also affected ecosystem services and biodiversity in the pine-oak forest, but especially in the dry tropical forest (Maldonado 1997; Arias et al. 2002; Rzedowski 1978). Hence, the rural population has lost its major supporters of ecosystem services, generating additional pressures on the social subsystem, especially with the relatively high population growth. The absence of conditions for survival in the rural areas has driven

[6] When the triple alliance of the Aztecs dominated the region, they demanded excessive tributes and the over-exploitation of the Tlahuicas brought inequality. For this reason the king of the Tlahuicas decided to marry his daughter to the emperor of Tenochtitlan, in exchange for a reduction in the amount of tribute.

young people to cities and abroad, but has also increased the social vulnerability of those remaining behind. In the mountain area of the Sierra Madre Sur, corn and bean production was lost around 1990, and after 2005 wind and water erosion also destroyed the rangeland for livestock. These problems were exacerbated by the effects of extreme meteorological events (flash floods in low-lying fields and especially drought in the mountain areas) related to climate variability and climate change (IPCC 2012). People confronted with survival problems have increasingly migrated to the USA. In villages in the south, more than two-thirds of the families today have at least one member who is a migrant in the USA. The lack of safe water and land have also exacerbated local conflicts over the control of water and irrigated land and access to groundwater, where the families of the traditional chiefdoms have grabbed these resources for the benefit of corrupt leaders.

4.4.2 Social Vulnerability

The neo-liberal policy operating since 1985 in Mexico has increased social inequality. In the study areas it has caused acute marginalization (Cagigal Rodríguez 2012, p. 23), and historical poverty has increased. A rapid modernization process, governed by short-term interests of urbanization and land-use change, has created new vulnerabilities and additional environmental degradation.

Furthermore, a policy of the indiscriminate importation of highly subsidized basic products has forced small farmers out of agricultural production because of the collapse in the prices for their crops and the rise in costs. In Mexico in 2013, more than twelve million people experienced hunger; in the state of Morelos about 390,000 people. The loss of livelihood has further increased rural and suburban misery.[7] Because of their low income, housewives have often chosen to buy cheap junk food, which in the medium term has increased obesity and health problems for children (diabetes). In health terms per 1,000 people, undernourishment still affects 5.3; diabetes 14.6; cancer 74.8; infections 4.1; respiratory diseases 61; gastro-intestinal diseases 10; violence and accidents 8.5; and brain-cardiovascular strokes 21.

Chronic unemployment among men and their migration has forced women[8] without money to find different survival strategies: borrowing from neighbours or

[7] Of the people in the Yautepec River Basin, only 13.6 % are classified as living at a "low" level of marginality, while 4.8% % are classed as "very high", and 39.9 % as having a "high" level of marginality. This implies that 45 % of the population live in extreme poverty. Various government programmes have reduced the illiteracy rate from 11.9 % in 1990 to 6.3 % in 2010; this is related to population growth where children have increased their schooling. Compared with the rest of Mexico, the YRB is still below the national level of 8.6 years' schooling: in the YRB it is 8.2.

[8] In Morelos, 30 % of the all households are managed by women, mostly representing the poorest families, where children are obliged to support the family income. These families are also the most exposed to involvement in illegal activities and organized crime (INEGI 2010, 2012).

local shops, selling unwanted goods, organizing cooperatives for selling home-made handicrafts, and recently also providing services such as computer-based work, printing, etc. Many live on irregular land, often obtained by collective invasion. Many women have organized themselves and struggled to obtain basic services and government support (electricity, water, community centres, credit for productive activities, training, crop seeds, animals, other government subsidies), but also for the regularization of their land. These women rely on part-time jobs and multiple activities in services, handicrafts, food, and washing and ironing. Their fight for new public subsidies and poverty alleviation programmes (*Oportunidades*) has empowered these women and in this way they have consolidated their survival strategies (Oswald Spring 1991). Often they are fighting against intra-family violence and for social and economic consolidation, for productive activities, and for their communities and families. Facing unemployment and lack of income, men often become alcoholics, migrate or become involved in illegal activities such as cultivating illegal drugs, retail sale of drugs, or directly with the organized crime.

The first cycle of conflicts is related to unsustainable modernization: the sale of land to urban buyers provided the farmers with a short-term income, but deprived them in the longer term of a productive potential for maintaining, albeit precariously, their livelihood. Members of the family, often the husband and young people, are forced to emigrate, leaving in their places of origin poverty and conflict in the river basin, where the main problem is linked to access to water. A combination of inadequate management of natural resources, a lack of prevention policies and social system pressures related to population growth and short-term economic interests have produced extreme landscape transformation with dramatic losses of ecosystem services. Combined with many more slow on-going processes such as CC, environmental vulnerability has increased socio-economic disasters in which vulnerable people have often lost the conditions for survival and life.

A second cycle of conflicts is related to the change in land use from agriculture to chaotic urbanization. The loss of agricultural land has forced the people to search for jobs in the nearby industrial zones; during economic crises when there was a low demand for labour, the younger people moved to Mexico City or as undocumented migrant workers to the USA (Fig. 4.6). Without doubt, migration represents a coping strategy that is able to reduce socio-environmental pressures. A third cycle of conflict is linked to the young unemployed who join criminal gangs. However, not only does this region experience emigration, but migrants are also returning from the cities, because of unemployment, food scarcity and a lack of social services, due to the prevailing neo-liberal policy of the Mexican government since 1985. Thus, a fourth cycle is linked to intensive immigration from the neighbouring states of Guerrero, Puebla, Mexico and Mexico City, where people look for better conditions of life and jobs. These poor immigrants usually occupy land that is marginal and high-risk, often through collective invasion,

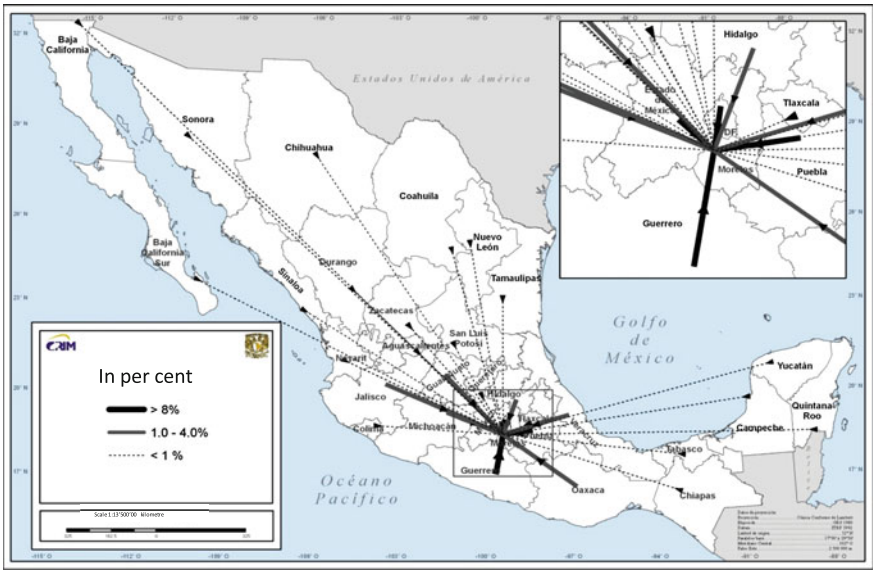

Fig. 4.6 Flows of immigration to Morelos: *Source* Oswald Spring et al. (2013, in press)

destroying the important ecosystems of the dry tropical forest and water recharge areas (El Texcal), but also putting their own lives at risk. Their houses are constructed out of precarious materials, often recycled from waste. During extreme events these shelters cannot resist flash floods, and sometimes people are buried under the mud; in this way, a link is established between social and environmental vulnerability. These four scenarios of conflict may increase the social and environmental vulnerability of the poorest people, but they also result in conflict constellations in a region facing natural and social challenges that has a high level of social inequity as expressed by the Gini index (Fig. 4.7), especially in *los Altos* (the highlands) of Morelos. In analytical terms, the combination of increasing environmental threats with social precariousness and inequity increases both the vulnerabilities and the negative feedback between them creates greater risks for the most vulnerable people, as well as producing social anomie (Durkheim 1999), personal unrest, alienation, and uncertainty.

Unsafe life conditions are exacerbated by untreated sewage from sugar factories, households, industries, other businesses, and by new dangers related to the use of plastic in households and agriculture. All these pressures are related to an unsustainable consumerism, where solid and liquid waste has increased water pollution. Thus, water has not only become scarce, but it has also been highly polluted, and the lack of urban planning combined with corruption and necessities

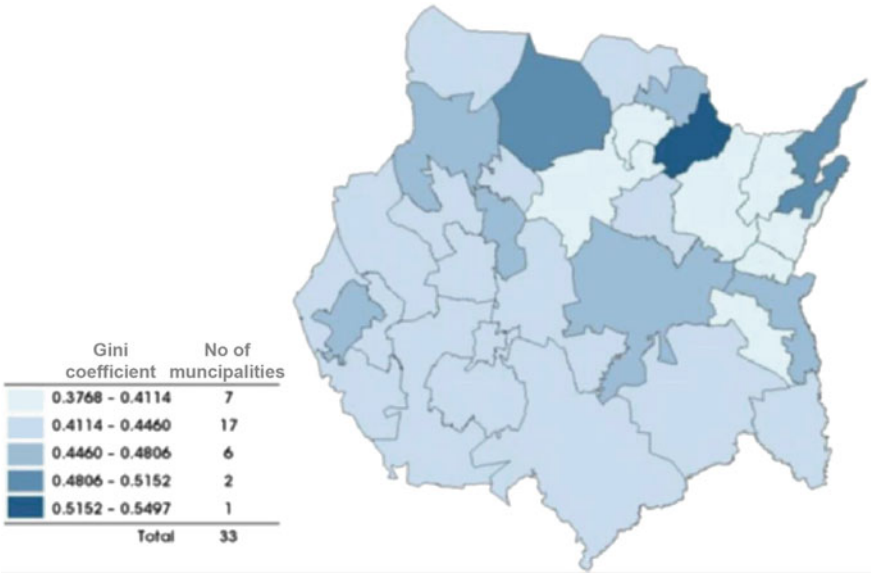

Fig. 4.7 Gini index in Morelos. *Source* Coneval (2012), p. 26

to land[9] has allowed several invasions into the river basin. During the rainy season affluents carry this waste downstream and during extreme floods the accumulation of garbage builds levees that finally break under the pressure of water and then flood the urban area, destroying public infrastructure, productive tools, services and agricultural fields. But the liquid and solid wastes also contaminate soil and air, generating vermin, flies, cockroaches, bacteria and viruses and thus facilitating water-borne diseases. By adding the loss of food quality and environmental services, a vicious circle is created where further environmental degradation additionally impoverishes the local population.

Finally, events in the short term, such as organized crime, greater violence and gangs, have brought new unrest into the YRB, triggered by the return of family members who have been expelled from the USA as undocumented migrants, some of them being dependent on drugs and alcohol. Instead of sending remittances, they have become a liability for the extended family, because they often return with no money. They lack a house to live in and some of them have been in jail in the USA for several months before being expelled and so have also been psychologically affected. These social problems are becoming worse due to threats related to climate change, flash floods and droughts.

[9] These invasions have introduced additional threats during flash floods. They are partially responsible for blocking the flow of water upstream and accumulating waste. Once these obstacles are eliminated, the velocity and amount of water increase, and these phenomena often produce disasters downstream.

4.4.3 Interaction Between Environmental and Social Vulnerability

These critical social conditions are further aggravated by public insecurity, the presence of organized crime related to the production of illegal crops, and fighting between criminal gangs for the control of trafficking routes, kidnapping, extortion and robbery. This has resulted in a greater welfare loss, aggravated by crop failures and the failure of the state and federal governments to support communities affected by climate variability. In the Metropolitan Area of Cuautla, public violence, ethnic and political conflicts, chaotic urbanization, migration and accidents involving agrochemicals or technological disasters have not only increased existing social vulnerability, but made it difficult to overcome.

Because of this environmental and social vulnerability, during the past decade poverty has increased (Oswald Spring 2013). The management of forests is still limited to commercial use, and so forest fires are hardly ever prevented, and higher temperatures increase bush fires, and these also affect natural protected areas. 98 % of forest fires are human-induced, and are sometimes caused deliberately to justify or force land-use changes. For this reason, 80 % of the soil in the YRB shows signs of erosion, aggravated by the illegal activities of loggers which are often controlled by organized crime. This interaction of social and environmental factors increases both social and environmental threats and the inadequate waste management in the basin increases the risks of disasters.

This interrelationship of high-risk natural and precarious social conditions creates challenges for the region as a whole and for each community in particular. The different levels of government must reduce and prevent these risks and train people to deal better with existing threats. Initial cooperation between the three levels of government for *disaster risk reduction* (DRR) did not include preventive behaviour. People become aware of a disaster after being harmed and thus their confidence in their authorities is low. Corruption during the post-disaster reconstruction phase has increased distrust in authorities, and this has limited participation by citizens in increasing resilience and adapting to adverse conditions.

Since the 1950s population growth, land-use change, deforestation, and since 2000 rapid urbanization have caused a reduction in forests and jungle, but increasingly also in agricultural land. The natural environment and ecosystem services have deteriorated significantly due to deforestation. Changes in precipitation have increased due to GEC. Developments over several centuries or decades, reinforced by recent changes produced by humans and the climate, require changes in traditional coping strategies. New threats and risks challenge the life, livelihood and well-being of especially the vulnerable people who are often unable to cope with these new threats.

For this reason, when families, neighbourhoods and communities repeatedly face extreme events they organize themselves. They want to understand what has changed and how they can best mitigate the negative outcomes. They call for an integrated management of the river basin and a collective river management plan

to reduce the annual threats and losses by protecting people, infrastructure, wealth and investments.

4.5 Coping Strategies: Bottom-Up and Top-Down Linkages with a Gender Perspective

In the survey the question was raised of what people know about the risks posed by GEC in the Yautepec river basin, and what their past experience was with decision-making processes relevant to coping with changing environmental and social conditions. Most people linked the impact of disasters to hydrometeorological events: 42.4 % to the irregular monsoon season; 29.5 % to longer dry periods; 15.0 % to insufficient precipitation and 13.1 % to too much rain (Fig. 4.8). During four focus group sessions the contradiction between a surplus and a lack of rain was discussed, and the people affected defined it in terms of flash floods, where within a short time large quantities of water flood the plain of the YRB, beyond the capacity of the river bed to cope, while at the same time the dry period is becoming longer, temperatures hotter and the interestival drought more irregular. All these phenomena affect corn production with too little water during the growing period and too much rain during the period of ripening when the plant requires less. In the survey, farmers mentioned irregular rainfall. This results in complete crop failures or in important reductions in yield, or in increased plagues and pests.

When asked who was responsible for preventing future disasters, 62 % of those interviewed said that both the authorities and the people affected were jointly responsible, while 16 % named the authorities, 14 % the people affected, and 8 % did not know (Fig. 4.9). During the annual extreme events people have learned that they must collaborate with the authorities (Hunter 2005). As a first agreement with citizens, the local authorities have installed a short-term early warning system: when the river rises more than one metre, an initial audible alert automatically

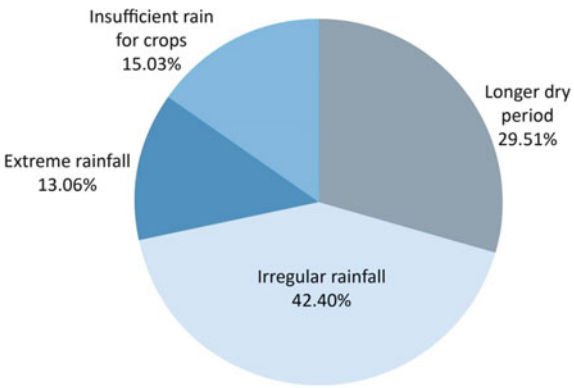

Fig. 4.8 Risks posed by GEC and CC. *Source* Survey conducted by CRIM–UNAM (2010–2012)

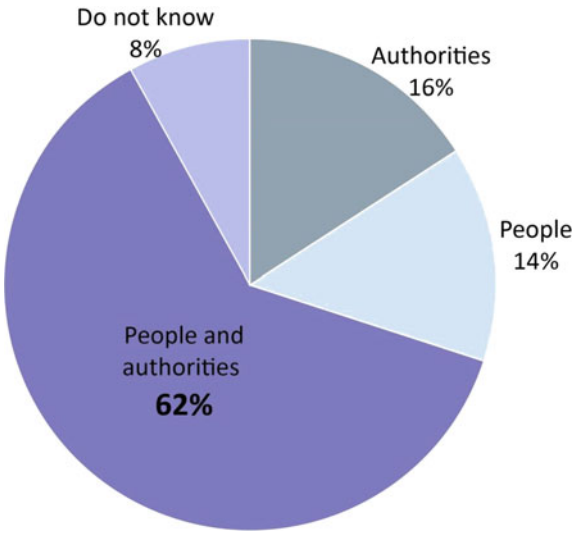

Fig. 4.9 Who is responsible for risks in the Yautepec River Basin? *Source* Survey conducted by CRIM–UNAM (2010–2012)

warns the people; if the river rises more than 1.5 m, a loud siren warns people to evacuate immediately. The velocity of the water sometimes allows only 5 min for evacuation and now, when the rainy season starts, people prepare their important documents so that they can rush to the refuge. The federal government must inform people several days in advance by radio and TV and in local newspapers about the development of tropical storms and hurricanes, both on the Pacific and Atlantic coasts, so that people can prepare for a possible evacuation. There is still no early warning for droughts and the data supplied at the beginning of the dry season are not periodically updated and are often not clear enough to promote a change of crops before the monsoon starts. A better forecast might help the farmers to programme their crops, e.g. to produce crops requiring less water, and in extreme cases not to cultivate the land or to sell their livestock in advance.

The local governments of the municipalities in the basin have collaborated closely with the ministry of the environment and civil protection at the state level and the National Water Commission (Conagua), as well as with scientists, universities and research institutes, affected enterprises, local traders, schoolteachers, and people from the markets, in order to establish an assessment method for adaptation. This has increased the credibility of preventive activities. The sources of information are critically scanned and errors or misinformation are periodically corrected. A first agreement is in place among affected people to develop an emergency plan and to periodically evaluate the early warning system. People who did not receive local information in time or who did not understand the audible warnings were later locally trained, evacuation routes were better marked, and shelters were prepared at the start of the rainy season to avoid children having to miss classes when schools are transformed into refuges.

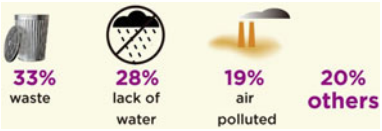

Fig. 4.10 Environmental problems in the Yautepec River Basin. *Source* Survey conducted by CRIM–UNAM (2010–2012)

Once the preventive part and the early warning were settled, then key questions of how to mitigate and to adapt to these new climate and environmental situations were collectively discussed. People understood that environmental and social problems have triggered the negative outcome of extreme events. 33 % of those interviewed insisted that the mismanagement of waste increased the risks; 28 % mentioned the lack of water; 19 % air pollution; and 20 % other problems (Fig. 4.10). On the root causes of the increased frequency of extreme events, 45 % stated that all natural resources are being destroyed; 22 % pointed to air quality and higher temperature; 28 % to a lack of water; and 13 % to the destruction of forests and the erosion of the river basin (Fig. 4.11). Scientific assessment based on satellite images indicated that 80 % of the soil shows different degrees of erosion, from light to severe.

These data show that the region is not only seriously affected by global environmental change but that people are also conscious that the traditional way of dealing with natural events is no longer feasible. Asked directly about local environmental risks, 65 % of those interviewed said that the lack of water was a significant threat, 23 % mentioned floods and 12 % the loss of harvests (Fig. 4.12). The differences are related to farmers with irrigation and those living on the slopes

Fig. 4.11 Conservation of resources in the Yautepec River Basin. *Source* Survey conducted by CRIM–UNAM (2010–2012)

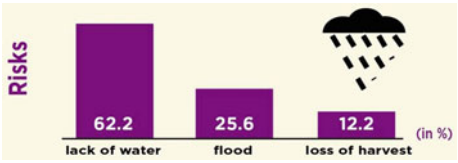

Fig. 4.12 Most important risks for people in the Yautepec River Basin. *Source* Survey conducted by CRIM–UNAM (2010–2012)

of the mountains without the possibility of irrigating their crops. These general differences are reflected in the survival strategies of communities and families affected by GEC.

Progressive deterioration of their purchase power parity (PPP), increases in food prices greater than any increases in their salary, and the long distances between their homes and their work confront migrants in towns with the limits of survival. Some returned migrants argued that they had travelled for 2 h or more every day just to get to a temporary job and then to return home to sleep for a 5 h. In the villages, small plots of land are cheaper, and with an orchard they can plant their own subsistence crops. These people understand that distances within the village are shorter and security is often better than in the suburbs with their organized crime. The cultivation of *nopal* (a cactus) on the high plateau requires additional manpower, and weekend houses offer new opportunities for permanent or temporary jobs.

Finally, there exists an additional gender vulnerability that affects women, children, young people, the disabled and the elderly. Women not only suffer from historical discrimination and violence that they themselves identify as quadruple discrimination (as indigenous, women, migrant and poor; Estrada 2013), but during the migration process their vulnerability increases (Oswald Spring 2012); most migrant women have been raped during their international transit, and girls are often trafficked and sexually exploited (Catholic Church 2008). During disasters they die in higher numbers because of historical discrimination, lack of training, and constructed social representations and trained identities where women care for and protect family members and neighbours, as well as domestic animals (Ariyabandu and Fonseka 2009; Oswald Spring 2008; Birkman 2006), sometimes at the cost of their own lives. Women staying at home face new tasks and challenges as heads of households. They are now responsible for the fields, the household, the education of the children and the household income, but often they also have to care for their parents.

This workload creates enormous psychological pressures and many women require antidepressant drugs to overcome the tensions of coping with these new, unknown and complex tasks. Among these highly vulnerable women and exposed communities, even non-extreme events can produce dangerous impacts and loss of lives and livelihood. Nevertheless, women facing these new roles do not just suffer, but are also empowered. They become responsible for local public services such as schools and water and waste management, where often they must struggle with dominant and well-established patriarchal leaders who are generally extremely corrupt. Their transparent management of the water system, for example, has not only reduced infant mortality and disease, but has also increased the availability of water to houses on the outskirts. Their public involvement is changing traditional local politics. The next steps may be to compete for jobs as municipal president or as local or federal deputies or senators, with new bottom-up ideas about how to address this dual vulnerability to social and environmental deterioration.

4.6 Conclusions: Adaptation for an Alternative Livelihood from the Bottom Up

On the research question of how poor people can adapt in order to overcome social and environmental vulnerability in a high-risk river basin facing the effects of global environmental change, the empirical part of the investigation produced several proposals. Small farmers affected by GEC see different alternatives: (a) change from subsistence crops (corn) to commercial ones (green and red tomatoes), (b) change from commercial crops with higher demands for water to those with lower (sugar cane to sorghum; tomatoes to nopal, etc.), (c) internal and international migration and return migration strategies (Rivera Sánchez 2012) to cope with a more unpredictable environment and with social deterioration. Adaptation processes differ not only at a local level, but also between families and within each family. Most of these families have not yet understood the full impact of regressive globalization (Held/McGrew 2007; Bohle 2001, 2002, 2007) and global environmental change (Brauch et al. 2008, 2009, 2011; Oswald Spring 2011a). Therefore, their adaptation strategy is developed step by step, often with high costs in material and emotional loss, just to maintain or improve their precarious livelihood. Most of the families in the YRB are without government support, so that they need to find a way of dealing with a complicated situation of life and livelihood on their own.

In the YRB, local people understand the complexity (Fig. 4.13) of both environmental and social vulnerability, expressed in their low Human Development Index (HDI). After their adaptation assessment, they have developed adaptation tools and new capacities for dealing with more difficult environmental and social conditions. One crucial theme is related to energy use and efficiency, and the energy returned on energy invested (EROEI) is improved with green agriculture, integrated waste organization and systemic water management (Oswald Spring 2011a). The double vulnerability approach proposed in this chapter on the one hand allows people to train at a local level for human adaptation capacity, and on the other hand, environmental management through the recycling of organic waste, paper, glass and plastic means that people not only reduce the dangers of waste in the rivers, but generate income and new products. The massive reforestation in the upper-stream area allows the infiltration of rain and reduces flash floods and sedimentation. In the YRB, there are still a need for experiments with renewable energy that would be able to consolidate a sustainable economic system with new job opportunities and income. The combination of different sustainable processes may also increase the level of local adaptation, reducing migration and the pressure on women left behind. The double circle of human development in Fig. 4.13 represents a sustainable and efficient way to improve human adaptation to GEC in general, and in the YRB in particular.

By improving ecosystem services and income through a multiplicity of sustainable activities, people are creating an environment with low demand for energy and productive inputs. Composting organic waste can increase natural soil fertility and reduces the need for agrochemicals. Simultaneously, these practices are

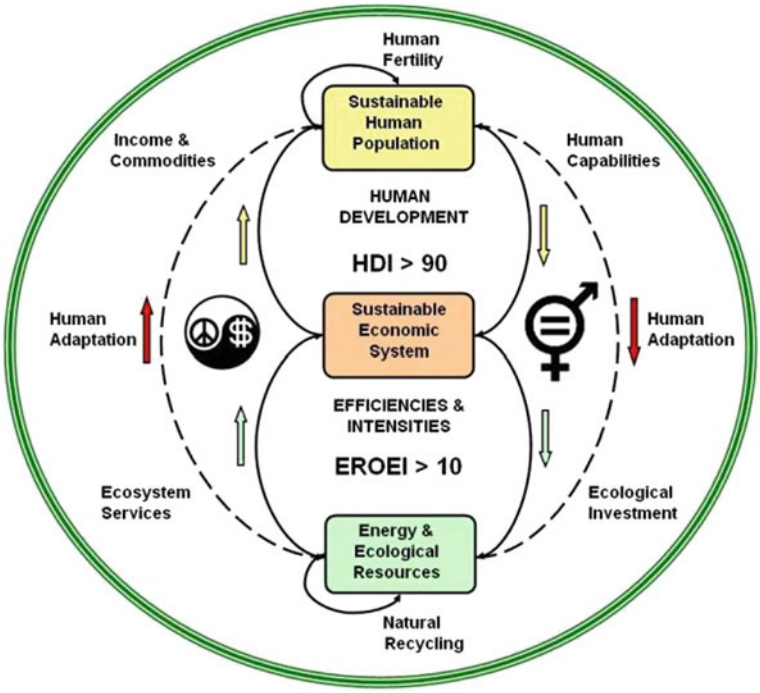

Fig. 4.13 Sustainable adaptation. *Source* Jackson (2011) p. 195

improving human health and providing knowledge of organic agriculture and environmental services. Women confronted with new roles as head of households because of the migration of their husbands are at the forefront in the field of sustainability. They have changed the productive processes in their fields and have prioritized healthy food for their family instead of cash crops with high inputs of agrochemicals. They have also become involved in public activities and have changed the administration of local public services. With more government support and training, these women could create a sustainable human population at local level. Adaptation is a complex process and women, men, children, adolescents and the elderly must find their way towards human adaptation. Promoting public policies for training to adapt locally means that people can deal better with extreme events. Organized and prepared people are participating more actively in the improvement of their own communities and so are setting out on a constructive and sustainable pathway towards integrated adaptation processes in a high-risk region.

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Part II
Exploring Peace Ecology: Peace and Environmental Education, Mobile Learning and Rebuilding Community

Chapter 5
Mobile Learning, Rebuilding Community Through Building Communities, Supporting Community Capacities: Post-Natural Disaster Experiences

Kazuhiro Monden

Abstract This chapter explores how risk communications embodied in online resources can support, empower and educate individuals throughout different stages of disaster, as identified in disaster sociology, which explores social phenomena resulting from human responses to social disruptions following disasters. Part of responding to, planning for, and experiencing disaster is seeking information in response to perceived risks, so that appropriate responses can be made. With on-going advancement in *Information and Communication Technology* (ICT), information about disaster-related risks is readily available online. These resources communicate to individuals risks, how to prepare for disaster and the best routes to safety. The effectiveness of online risk communication depends on individuals' particular needs and how they perceive risk. Furthermore, engaging in risk communication through a variety of online resources allows individuals to transform their experiences into knowledge. Individuals can adjust skills and knowledge required for recovery, as well as reduce fear and anxiety. Carefully designed and theoretically informed online resources can empower and educate individuals through facilitating increased resilience, social cohesion and rebuilding of communities.

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5.1 Introduction

Interactions between human society and risks and hazards have always been a part of social processes in human history. However, disasters in today's globalized world are increasingly complex with newer dimensions. These dimensions intensify challenges to the sociocultural well-being of peoples and societies hence they threaten human security and peace beyond traditional political and sociocultural boundaries. Part of responding to, planning for, and experiencing disaster is engaging in risk communication in response to social challenges, so that appropriate responses can be made. With rapid advancement of *Information and Communication Technology* (ICT) today, risk communication takes place in both online and offline spaces. Thus, the chapter focuses on how risk communication embodied in a variety of online resources supports empowerment and education of threatened individuals examining the theoretical, conceptual and research literature related to this problem.

The Sect. 5.2 presents an overview of selected theories from the sociology of disaster with respect to human security. Disaster sociology is a broad and multidisciplinary field that defines disasters as social phenomena resulting from social changes as a part of human responses to disasters. The research, supported by literature, identifies the social changes which occur immediately after a disaster that generate newer risks and hazards threatening individuals' sociocultural well-being and human security. Hence, individuals engage in learning processes to acquire different types of knowledge to assist adaptation and adjustment to new social conditions. This is because individuals seek to minimize their vulnerabilities in the disaster's post-impact phase, which may lead to their empowerment and potentially enhance their recovery and rebuilding efforts.

Section 5.3 discusses the roles of risk communications as part of human response to disasters through review of relevant literature arguing that individuals' risk perception is constructed and shaped by feelings towards, cultural interpretation of, and types of information about risk. Knowledge acquired via risk communication influences individuals' risk perceptions through the processes of social amplification of risks grounded in the *Social Amplification of Risk Framework* (SARF) by Kasperson et al. (1988). It discusses how the quality of information embodied in risk communication influences efforts by individuals coping with fear and anxiety to face the unknown and to strengthen their sociocultural well-being.

Section 5.4 discusses how risk communication embodied in a variety of online resources, namely online communities, social media and micro-blogging, can

enhance information seeking and social and action support functions. A number of studies drawn from literature demonstrate that each of the currently available online resources has different capacities, while enhancing individuals' capacities to access diverse information sources. Thus, they will be assisted to adjust skills and knowledge required for recovering their sociocultural well-being, as well as reduce fear and anxiety. Hence risk communication embodied in a variety of online resources can support, empower and educate disaster-stricken individuals.

Section 5.5 explores how risk communication through online resources can support individuals affected by disasters, transforming their experiences into knowledge and skills throughout different phases of disaster. The section argues that individuals' empowerment and education are synonymous and can facilitate restoring and rebuilding resilience of individuals and community. Developing an online community can thus facilitate the rebuilding of their offline community, as well as improving their well-being and human security.

5.2 Disaster Sociology

Disasters are defined as social phenomena which affect vulnerability and resiliency, thus resulting in a variety of social changes within a society (Boin 2005; Hewitt and Kenneth 2013a, b; Quarantelli 2005). They threaten human security and peace beyond traditional political and sociocultural boundaries. Hence, individuals seek to learn how to adapt and adjust to the post-disaster environment through recovering and rebuilding their lives towards their eventual empowerment.

Disasters can be categorized into two types, 'consensus' and 'conflict'. The consensus type of crises includes natural and technological disasters while the conflict type of crises refers to riots and terrorist attacks instigated by social actor (s) who seek to worsen the situation to achieve their objective(s) through creating fear in societies (Quarantelli et al. 2007). Disasters and crises have potential to disrupt societies beyond traditional political and sociocultural boundaries (Quarantelli et al. 2007). This is because the social nature of disaster and crises come "about from the destructive interactions of environmental hazards, peoples' exposure, vulnerability, and absent protections" impacting on individuals' daily lives irrespective of distances (Hewitt 2013b: 5). For example, the terrorist attack of 11 September 2001 and the Great East Japan Earthquake in 2011 followed by the tsunami and nuclear power plant accident in Fukushima, demonstrate the complexity of disasters and crises in a social context. The former added a fear for free movement by a passenger airliner, which was used for the terrorist attack that changed the way we travel forever. The latter reminded us of the risks of a nuclear power plant accident, whereby radiation can travel through air and the sea irrespective of national boundaries.

Different types of disasters and crises generate newer risks and hazards which impact on sociocultural well-being of peoples and their human security according to individuals' specific historical and cultural conditions. As Hewitt explains,

"disproportionate losses in particular places and groups of people underscore the role of social conditions in disasters" such as "impoverishment and pre-existing disadvantage identify the majority of disaster victims, as well as disproportionate losses in sub-groups amongst them" (Hewitt 2013a: 2). In this sense, threats to human security posed by disasters are partly rooted in pre-disaster social conditions, which individuals face including "the mesh of more or less inescapable social constraints, expectations, responsibilities, and happenings" (Hewitt 2013b: 13).

This social nature of disasters begs the question of how disasters pose risks, threats, challenges and vulnerabilities to individuals' human security. Brauch (2011: 103–104) introduced 'four pillars of human security' including, 'freedom from hazard impact', 'freedom from want', 'freedom from fear' and 'freedom to live in dignity'. Mesjasz linking these pillars with individual's vulnerabilities identified human security as 'freedom from hazard impact' posed by hazards and disasters and 'freedom from fear' posed by "the probability that hazards may pose a 'survival dilemma' for the people most affected by extreme weather events" (Mesjasz 2011: 150). Under this notion, disasters threaten the sociocultural well-being of peoples and human security by impacting on their desire to fulfil basic human needs, health, livelihood, dignity, human rights and social justice (Brauch 2011; Hewitt 2013b; Mesjasz 2011). Thus, disasters pose immediate risks, threats and challenges to individuals' human security.

For instance, 315,000 individuals are still forced to live in evacuation or temporary housing within directly affected areas following the Great East Japan Earthquake in 2011. Another 66,000 individuals are relocated and forced to live elsewhere across Japan (Kahoku Shimpo 2013).[1] Such situations may cause loss of families and employment opportunities in communities reinforced by the prolonged and slow recovery processes. Under these conditions, threats to human security may appear in a form of *kodokushi,* a phrase that refers to 'lonely death' for people who live alone and die alone without being noticed over a period of time (Nishikawa 2012). Some individuals have become isolated because his/her family members were killed by the disaster. Frequently they are elderly individuals who could not receive adequate care and were unable to call for help. These lonely deaths occurred during the recovery phase of the 1995 Great Hanshin Earthquake and also after the Great East Japan Earthquake in 2011 (Asahi Shimbun 2012).[2] For families, risks and challenges include fear of radiation caused by the Fukushima Daiichi nuclear power plant accident in 2011 that was perceived as a risk affecting children. Parents

[1] "Focus, 3.11 Earthquake—Testimony/450 people isolated at the Kesennuma Central Community Centre, under the threat of raging frame, shortage of drinking water and food", in Japanese [Shoten, 3.11 Daijishin—Shogen/450 ninga koritsu, Kesennuma Chuo-kominkan/semaru moka, mizu, shokuryo kokatsu], in: *Kahoku Online Network*, 20 June 2011; at: http://www.kahoku.co.jp/spe/spe_sys1071/20110620_01.htm (19 October 2012).

[2] "Disaster-related death reached 1618 due to prolonged evacuation life, according to the Reconstruction Agency", in Japanese [Saigai kanrenshi 1618 nin, hinan seikatsu chokika de, Fukkoucho], in: *Asahi Shimbun*, 27 April 2012; at: http://www.asahi.com/special/10005/TKY201204270195.html (27 April 2012).

were forced to take *boshihinan*[3] when mothers and children self-relocated from Fukushima to other parts of Japan or overseas while fathers stayed behind to continue work or rebuild business. They faced risks of heavy financial burden, family breakdown that may result in divorce, being bullied at school or from the relocated community as they are sometimes seen as benefitting from the compensations (Asahi Shimbun Digital 2013).[4]

These risks, threats and challenges expose individuals to newer vulnerabilities that create new social conditions disrupting the wellbeing of individuals and undermining human security. Individuals who seek to adjust and adapt to the post-disaster environment are able to minimize their vulnerabilities and lead fulfilling lifes.

Vulnerability is determined through individuals' responses to disruptions and how they adjust to new social conditions during disaster recovery. Individuals undertake adaptive actions in a form of social changes to secure social resources to minimize their vulnerability (Dynes 1998; Hewitt 2013b). In the process, they undertake social adjustment thus changing their behaviour patterns and their expectations toward the social system (Boin and 't Hart 2007; Cutter 2005). For example, people evacuated to a shelter, such as a community centre or a school, are likely to adjust to a communal life by sharing limited resources such as accessing water, food, sanitations and communication infrastructure to connect with relatives and friends (Matsuzaki 2013).[5] Hence, recovering from disaster needs changes and transitions in social interactions to adapt to new conditions.

Social changes as aggregated human responses have diverse dimensions and require individuals to acquire different forms of knowledge to minimize their vulnerability. As Cardona (2011: 116) described:

> The lack of knowledge of causal factors and effects of disasters, the lack of a sense of the community history and the lack of preparation and understanding of individual and group responses to disaster are all aspects that make a community more vulnerable. Deficient education or lack of educational coverage in a susceptible community and the lack of socialization of information also increase vulnerability.

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[3] The term *boshihinan* [母子避難] can be broadly defined that mother [母] and child or children [子供] evacuate [避難] from their home and area affected by a disaster to the safer area in Japan or overseas while the father stayed behind to continue work or rebuild the business. They are forced to have a double life or *niju seikatsu* [二重生活] by building a new life in the relocated community while seeking to maintain their social life in their original home (Gan and Sakiko 2013: 139–141); Boshihinan from Fukushima: Asahi Shimbun Digital News Special", in Japanese [Fukushima kara no Boshihinan: Asahi Shinbun Degitaru News Tokushu], in: *Asahi Shimbun Digital*, 2012; at: http://www.asahi.com/special/genpatsu_hinan/ (15 March 2013).

[4] "Boshihinan from Fukushima: Asahi Shimbun Digital News Special", in Japanese [Fukushima kara no Boshihinan: Asahi Shinbun Degitaru News Tokushu], in: *Asahi Shimbun Digital*, 2012; at: http://www.asahi.com/special/genpatsu_hinan/ (15 March 2013).

[5] Matsuzaki, Koji: "Suffered at the Great Hanshin Earthquake, Started sending message via internet, Takayuki Sato (2)", in Japanese [Hanshin daishinsai de hesai, netto hassin kaishi, Sato Takayuki san (2)], in: *Asahi Shimbun*, 12 March 2013; at: http://www.asahi.com/and_M/living/TKY201303110194.html (12 March 2013).

Minimizing these vulnerabilities, individuals engage in various different learning contexts throughout the three phases of the disaster time frame, namely, 'pre-impact', 'trans-impact' and 'post-impact' phases (Quarantelli 1980: 10–17). Individuals in the 'pre-impact' phase acquire knowledge through engagement in activities such as prevention and mitigation to prepare for disaster. The 'trans-impact' focus on activities from immediately before to immediately after the impact of disaster. In this context, individuals seek knowledge to secure the lives and social resources such as water and electricity. In the process, they engage in social changing efforts through adapting and adjusting their existing knowledge in response to a disaster (Quarantelli et al. 2007).

The 'post-impact' phase focuses on long-term remedy and recovery activities. In the process, a variety of social actors participate in information sharing activities that inform individuals' rationales and actions (Gioia and Chittipeddi 1991). In this phase, individuals' learning occurs when they engage in collective sense-making efforts through information sharing and experiences from disaster (Kendra et al. 2006, 2007). In this sense this chapter explores education of individuals in the post-impact phase.

Individuals' learning potentially leads to their empowerment and increases resilience. Empowerment is the process in which individuals gain and regain their control. In this sense, individuals' resilience can be enhanced through learning to cope with fear and anxiety arising from uncertainties in experiencing disaster (Norris et al. 2008). In gaining skills and knowledge, individuals will be able to rehabilitate and readjust to the post-disaster environment hence they can be empowered.

Research in disaster sociology and human security has demonstrated that disaster creates multi-dimensional environments which generate a variety of risks, threats and challenges to individuals' human security. In these circumstances, individuals seek to minimize vulnerability by engaging in learning to recover and rebuild their daily lives through adapting and adjusting to post-disaster contexts. However, human responses to social changes resulting from disasters are further enhanced by using carefully designed and theoretically informed risk communication.

5.3 Risk Communication

Individuals' risk perceptions are determined by their affective responses and cultural interpretation of risk. As part of human responses to disaster, individuals form a perception of risk or perceived risk that potentially generates fear and anxiety when individuals are uncertain about specific disaster risks. Thus, they often seek information to cope with uncertainties. In part, individuals engage in learning through risk communication in online and offline forms to acquire information and knowledge to make appropriate responses to disasters. Thus, the *Social Amplification of Risk Framework* (SARF; Kasperson et al. 1988) will help to explain how risk information embedded in risk communication influences individuals' risk

perception through social processes of social amplification of risk. The literature suggests that individuals seek clear and qualitatively acceptable information to cope with fear and anxiety from the unknown.

5.3.1 Risk and Perception of Risk

A perceived risk is socially constructed through what individuals recognise as fear and what risk is acceptable (Kasperson et al. 1988). Risk only occurs when an object, hazard and event manifest potential consequences of psychological and physical harm (Slovic 2000a). Risk by definition is not an object or hazard or event per se but is "a product of social experience, including communication about potential consequences of a potentially hazardous event or series of events" (Renn 1991: 289).

Individuals' perceived risks are shaped depending on their experiences and culture (Renn 1991). Culture shapes their responses to risk and their risk perceptions are derived from their beliefs, feelings, values and views based on their specific sociocultural dispositions (Cardona 2011), their specific social rules and norms, which shape their specific cultural interpretation of on-going experiences within specific situations and contexts (Renn 1991).

Risk perceptions are influenced by information provided through communication. The kind of information individuals possess or can obtain influences their risk perception which can be categorized into two opposing types of risks. Risks that generate fear and anxiety and risks that are considered as acceptable. For example, nuclear technologies such as nuclear power plants and x-rays are perceived differently. The former is perceived to be a high risk but the latter is acceptable and safe (Slovic et al. 2000). Thus, some radiation-related events generate higher fear and anxiety than others (Wilkinson 2001).

Literature in this section suggests that the risk is determined by the social processes in which individuals construct their risk perception depending upon what types of information they possess about risk. Fear and anxiety can be heightened as a result of a lack of information and knowledge about situations and events. Thus individuals engage in risk communication enabling them to make appropriate responses to on-going recovery efforts.

5.3.2 Risk Communication

Individuals engage in risk communication to interact with risks as a part of social processes responding to disasters. They seek, assist, and exchange relevant information and knowledge. These are learning processes, through which individuals determine perceived risks and make appropriate responses to risks (Lang et al. 2001).

In general, risk communications are designed and provided to individuals and community by public organisations. These risk communications convey and transmit risk information containing levels, significance and meaning of risks and decisions, actions, as well as policies aiming to manage or control risks (Renn and Ortwin 1991: 290). These risk communications can be categorized into four types where learning occurs (Renn and Ortwin 1991: 292):

1. *Change knowledge, opinions, or attitudes*: risk communications occur when individuals engage in learning about risks associated with tobacco through receiving public health warnings which may offer enhances knowledge and change opinions and attitudes toward tobacco.
2. *Encourage protective behaviour by individuals and groups*: risk communications take place in a form of evacuation warning and situational updates from state emergency agencies about bushfires. This may enhance individuals' knowledge on the situation that will motivate others to encourage undertaking protective actions.
3. *Create trust and confidence in the community*: risk communications occurs when individuals learn risks about the flu pandemic through information by the World Health Organisation. This may foster trust and confidence in responses of public health authorities.
4. *Enhance public participations of individuals*: information sharing through risk communications about common risks in a community which may foster collaborative learning by organizing emergency/evacuation exercises. Hence individuals share knowledge about risks and learn skills how to respond toward common risks thus enhancing public participation of individuals.

These risk messages are grounded in scientific and technical understanding, as well as cultural and social beliefs about risk (Reynolds et al. 2005). They interact with individuals' "psychological, social, cultural, institutional and political processes" that determine their response to risk (Paton 2005: 3). However, not all risk communications is designed systematically by public organizations but may occur informally at an individual level.

In this context, the SARF as an interdisciplinary risk analysis model allows examination of social processes of risk information. The framework considers risk at different social levels arising from risk events including crises and disasters within social structures (Kasperson et al. 2005). It draws upon "psychological, social, cultural, and institutional factors that interact with emergency events and thereby intensify or attenuate risk perceptions" (Chew and Eysenbach 2010: 1).

Amplification occurs in two stages. In the first stage, the 'signals' (information) about risk are processed by individuals and 'social amplification stations', including a variety of agents that provide a hub station to distribute risk information such as mass media and social networks (Kasperson et al. 1988: 181). This is followed by the second stage of amplification through which social stations engage in active "processing or augmenting the flow of risk 'signals' and interpreting their social meaning" in which activities will either "dampen the flow of signals, as in risk *attenuation*, or amplify them, as in risk *amplification*" (Kasperson et al. 2005: 10–11).

In this sense, socially constructed and attenuated risk information will have limited effects that are confined to the immediately concerned populations in affected areas. However, socially constructed and amplified risk information has the capacity to move across time and space, and creates effects on risk perception not only of individuals and social actors but also populations and societies beyond disaster areas (Kasperson et al. 2005).

Difference in the signal value embedded in risk information reflects characteristics of risk events and disasters. Some risk events are rated having a higher signal value than others thus amplifying risk information associated with the event (Slovic 2000a).

However, a failure in the processes of risk communication providing accurate information about risk and event has a potential to influence individuals' perceived risk that can heighten fear. For instance, *Fuhyohigai,* otherwise known as rumour damage, after the Fukushima nuclear power plant accident in 2011, generated public fear caused by inaccurate information (signals) generated by mass media and online social media (signal stations) that rippled across the globe (Sekiya 2011). This was partly due to inaccurate information rated to have a high signal value, and partly due to fear of possible radiation of contaminated products. This reinforced the changes in individuals' perceived risk towards products or travel associated with the name 'Fukushima', and to a large extent 'Japan', thus heightening the fear. This situation has threatened sociocultural well-being of people in the Tohoku region, particularly people working in the primary industries such as farmers and fishermen to rebuild their businesses (Tanaka et al. 2012; Thomson and Ito 2012). In other words, the case was not a hazard agent crisis per se but rather a failure in risk communication that increased individuals' perceived risk from fear of the unknown.

The literature suggests that the SARF enables analysis of how risk communication can support and assist human responses to disasters. This is because socially amplified messages about risks and hazards 'interact with processes of a psychological, social, institutional, and cultural nature in such a manner that they can increase or decrease perception of risk' (Quarantelli et al. 2007: 33). This raises the question of how individuals' learning to acquire knowledge obtained from risk communication can support them to cope with fear and anxiety from the unknown.

5.3.3 Fear and Anxiety from the Unknown

Responses to fear and anxiety caused by disasters drive individuals to engage in learning how to use trustworthy communication resources to improve information quality, thus enabling them to cope with the unknown. In the post-impact phase of disaster, individuals seek certainty. One of the ways they attempt to achieve this is by engaging in information seeking to obtain high quality and clear information (Lachlan et al. 2010). Failure to obtain such information can increase fear and uncertainty (Renn 1991).

Learning occurs as a result of acquiring relevant knowledge through accessing multiple information sources to improve trustworthiness, credibility and relevance of information about risk. The way a message is framed and the kind of messages embedded in information determines individuals' perceived risk which increases and decreases their level of fear and anxiety (Slovic 2000b). This is because "if trust is lacking, no form or process of communication will be satisfactory" (Slovic 2000c: 410). In this context, individuals engage in learning how to identify and use trustworthy communication resources. Any form of communication resource, including traditional mass media or online resources such as social networking sites, can potentially undermine trust by feeding inaccurate, biased, scaremongering and inappropriate information (Rodriguez et al. 2007). Thus, the quality of information obtained can influence the psychological factors to increase or decrease the level of anxiety, hence influencing their learning processes acquiring relevant knowledge about risk (Dynes and Tierney 1994).

Tanaka et al. (2012) examined whether Twitter's micro-blogging posts containing a rumour or a criticism of rumour could influence individuals' level of anxiety during the Fukushima nuclear power plant accident. The study found that a rumour post did not increase participants' anxiety but that those posts containing an accurate criticism against a rumour reduced the level of anxiety (Tanaka et al. 2012). In other words, individuals engage with learning to acquire knowledge through seeking trustworthy and credible information to reduce increased uncertainty, if not to prevent it.

Obtaining a clear certainty as a result of acquiring knowledge through risk communications even from trustworthy and legitimate sources may be harder then expected (Lang et al. 2001). Yet individuals can potentially decrease their uncertainty by engaging in risk communication to acquire knowledge through diverse online resources. Thus they need to learn how to acquire specific knowledge by seeking and obtaining information from trustworthy, credible and legitimate sources.

5.4 Online Resources

Risk communication through a variety of online resources, including online communities, social media and micro-blogging, enhance individuals' information seeking capacities via accessing diverse information sources. Online risk communication provides social and action-related support for concerned individuals in asynchronous, synchronous, interactive and spontaneous forms. In the process, individuals can transform their experiences into knowledge which allows them to adjust skills and knowledge required for recovery while reducing fear and anxiety. Thus online risk communication can support the empowerment and education of individuals.

5.4.1 Types of Online Resources

5.4.1.1 Online Communities

Integrating the notion of online communities into risk communication provides the rationale for applying learning theory as it will allow an online community to mediate between offline and online communities. In the process, an online community facilitates the rapid, expansive and interactive collaborative learning to support individuals and communities via a variety of online resources.

An online community as a learning community enhances collaborative learning for the development of skills and knowledge through a collective, interactive participation by individuals and a variety of social actors (Boon et al. 2012). It is 'a learning atmosphere, a context providing a supportive system from which sustainable learning processes are gained through a dialogue and collaborative' meaning-making and sense-making by individuals engaging in 'acquiring, generating, analysing, and structuring information' (Carlen and Jobring 2005: 273). In a disaster situation, collaborative learning can take place when individuals engage in risk communication through a variety of online resources.

Under the condition of disasters, individuals engaging in risk communication via online communities that facilitate rapid and expansive contact with a wider population, could foster interactive and collaborative information seeking (Shklovski et al. 2008: 136). They engage in an iterative process of saving, organizing and sharing their own sense-making activities about a disaster with their own online and offline social networks, and/or total strangers. Therefore online communities facilitate the sharing of updated information and evidence-based judgements thus fostering individual meaning-making and sense-making of personal experiences (Weick 2005). Online communities also potentially facilitate other information seekers' depth and speed in understanding emergent disaster information (Latonero and Shklovski 2011). Online communities supported by risk communication will expand social networks, foster online social and action support thus empowering and educating individuals in a disaster (Haythornthwaite and Kendall 2010).

The literature in this section has demonstrated that online communities potentially support education of individuals through enhancing risk communication. Different types of online resources include rapid and expansive online social media and micro-blogging that further enhance risk communication for individuals.

5.4.1.2 Social Media

Online social media networks are based on a collaborative and community based online environment through mediating technologies including social networking sites (Facebook, LinkedIn, MySpace) and online communities (Wikis, Wikipedia, YouTube, Flicker). Engaging in risk communication via online social media can

foster individuals' learning to use a variety of online resources for information seeking, such as websites from traditional mass media, government, emergency organisations, friends, and families (Jansen et al. 2009). Also, learning occurs when individuals function as an active signal station by disseminating risk information obtained from online resources and social networks. This way, individuals using social media potentially foster their learning about how risk information sent can spread across the globe.

The study on the use of online communities as a response to the October 2007 Southern California wildfires found that such online resources were in fact a part of social resources available to the community (Shklovski et al. 2008). Two different online communities based on emergent online websites, locally organized and situated, were used for information seeking as well as providing information in trans-impact and post-impact phases of the disaster. However, one site was used specifically as a response to the crisis focusing on immediate risks and concerns. The other site covered a wide range of issues including collective sense-making providing emotional support. The former fulfilled its functions and ceased to exist while the latter continued to function as a source for community information for long term recovery (Shklovski et al. 2008). In other words, carefully designed and theoretically informed online resources can facilitate supporting individuals information-seeking in response to fear of the unknown.

However, specific attention has been given to the function of micro-blogging which is a more interactive synchronous communication tool to enhance risk communication.

5.4.1.3 Micro-Blogging

Micro-blogging such as Twitter, a small online mediated communication, allows individuals to create short messages, to publish (post), re-publish (forward or 're-tweet'), and to reply (commenting). Latonero and Shklovski (2011: 2–3) point out that Twitter as a global social network and online community allows users to send and receive short messages synchronously while they 'rapidly broadcast and exchange small amounts of information with large audiences regardless of distance.' It became a popular and growing online platform to foster individuals' learning on how to use and integrate it for making their risk communication effective.

There is a growing body of research on the usability and effects of Twitter as a risk communication tool. Notable studies include Hughes and Palen (2009) who examined mass information seeking activities by using Twitter. Sutton et al. (2008) investigated the use of Twitter as an alternative risk communication tool apart from governmental and traditional risk information sources during the Southern California Wildfires. Starbird and Palen (2011) examined the use of the specific retweeting function of Twitter for self-organizing digital volunteers in response to crises.

However, there is also a body of research focusing on the negative consequences of Twitter for risk communication. These studies focus on the negative consequences of the word-of-mouth nature of Twitter and other micro-blogging (Jansen and Zhang 2009). Zhang (2012) examined three distinctive crises and disasters case studies in China, USA and Japan, which demonstrated that Twitter potentially causes online rumours that generate public fear and anxiety. As a result of its viral nature, Twitter can send ripples of disinformation and misinformation thus causing an increase of uncertainty among a population with minimal information (Sekiya 2011; Tanaka and Sakamoto 2012).

Despite these potential negative effects of Twitter, all these studies recognize its capacity to deploy information rapidly and expansively to the mass in a synchronous way. In other words, Twitter and other micro-blogging platforms allow individuals to obtain required information by tailoring information seeking efforts (Sutton et al. 2008). Moreover, it allows engagement in synchronous interactive communication in both non-disaster and disaster situations (Latonero and Shklovski 2011). Thus, these studies on micro-blogging clearly show that it possesses a useful potential for disasters and crisis situations. However, the usefulness of micro-blogging in disasters rests on the answer to the question what kind of roles online resources have in empowering and educating individuals.

5.4.2 Roles of Online Resources

5.4.2.1 Information Seeking

Information seeking through risk communication via diverse online resources and communities fosters online mediated social supports. This allows individuals to cope with stress situations arising from 'the inability to find accurate and relevant information' (Sutton et al. 2008: 5). Sutton et al. (2008) examined how individuals engage in information seeking. They found that individuals acquired knowledge to cope with their insecurity and uncertainty by engaging in interactive information seeking and sharing activities by using text-based online communities.

Further, information seeking plays important roles for remedy and recovery in the post-impact phase while it fosters individuals' learning processes (Knobloch and Solomon 2002). Individuals engage with learning through interpreting information required for their personal and community recovery efforts that they obtained via online and offline information seeking activities (Boon et al. 2012). At the same time, they engage in the learning processes of reconstructing and adjusting their risk perceptions according to their experiences from the disaster (Schellong 2008). By doing so, they adapt their new risk perception by transferring their experiences into knowledge. Newly acquired knowledge with a newly adapted risk perception could reduce their fear and anxiety (Sutton et al. 2008). Information seeking is an important tool for reducing fear and anxiety which can be a stepping stone toward recovery.

Information seeking through risk communication not only fosters collaboration and interactive social learning among individuals to reduce their uncertainty but also facilitates educational opportunities by accessing a variety of online resources. This can further be enhanced by social and action support offered through online resources.

5.4.2.2 Social and Action Support

Social support by risk communication is a communication effort fostering a variety of human relationships through online and offline social interaction which can offer individuals physical and emotional support (Haythornthwaite and Kendall 2010). Both online and offline risk communications enhance individuals' meaning-making and sense-making, and feelings of attachment, belonging and importance as a part of the community (Norris et al. 2008). Social support in the form of risk communication by information seeking also allows individuals to acquire information and knowledge to manage fear and anxiety. Hence they can retain and restore their personal control (Stallings 2005).

In the post-impact phase, individuals require emotional support. As well, they need to access a variety of social resources such as communications, long-term shelters/housing, transportation, medical and public administrative services, and capital including financial aid (Schellong 2008). In this context, risk communication via online communities can foster grassroots' action support.

In the aftermath of Hurricane Katrina in 2005, a group of individuals in a variety of online communities offered jobs, services, and financial assistance to those who were affected by the disasters. Torrey et al. (2007) examined the online mediated 'connected giving' activities from the outside. These activities included the donation and organized distribution of goods and services through online communities such as forums, bulletin boards, blogs, and personal websites. The study specifically observed two online communities, a small blog community and a larger forum-based community. The study found that the former was effective in the communication of risk during the trans-impact and early stages of post-impact recovery phases. It thus built trust among the community, but met difficulties to sustain it. On the other hand, the latter had difficulties in managing risk communication. Hence it took longer to build trust. However, the forum-based community was more strongly linked with the population and communities thus enabling it to offer sustained support in the longer term (Torrey et al. 2007). The findings of the study show that allowing people access to a variety of online communities will foster both short and long term social and action support by providing effective risk communication, when relevant information is available.

In summary, online communities generate trust that enhances long-term participation in the enduring recovery processes of individuals that can further be enhanced through using diverse online resources.

5.4.3 Online Resources Currently Available

A variety of online resources are available at all phases of crises and disasters, functioning as important risk communication tools with roles such as information seeking, social and action support. Furthermore, online resources for risk communication via mobile computing technologies allow individuals to weave their online and offline social networks rapidly and expansively by engaging and participating in online communities. This way, roles of online resources can expand globally and facilitate empowerment and education of individuals in the post-disaster recovery.

Accessing the Internet via personal mobile devices greatly increases individuals' capacity to communicate risk and enables them to engage in a variety of online resources. These resources include websites from a variety of public and private social actors, as well as social media tools (Acar and Muraki 2011). Accessing these online resources via mobile devices has increased individuals' capacity to engage in interactive risk communication with their social networks.

Example can be drawn from the immediate aftermath of the nuclear meltdown at the Fukushima Daiichi nuclear power plant in March 2011. The Mayor of Minami Soma city in Fukushima, Katsunobu Sakurai responded by posting a YouTube video titled *SOS from Minami Soma Mayor*. Socially constructed and amplified risk information embedded in his YouTube video rippled across the globe beyond time and space. The video message was posted on YouTube stream on 25 March 2011, and attracted more than 200,000 viewers within 10 days (Fackler 2011).[6] Thus Sakurai effectively used YouTube as an alternative risk communication tool to reach a variety of social groups via online social networks, instead of waiting for risk communications by the government in Tokyo and the *Tokyo Electric Power Company* (TEPCO). The first-hand information embedded in the YouTube video by Sakurai was disseminated globally and forced both the government and the TEPCO to respond. In spite of increased public criticism and protest against responses by the government and TEPCO, they did not improve trustworthiness, credibility, and specificity of risk information about subsequent incidents caused by the Daiichi nuclear power plant incident. Thus, more people engaged in risk communication to improve the quality of information which was more trustworthy and credible.

Online resources via personal mobile devices, such as smart phones and tablet computers, allow individuals to acquire information for their physical and emotional rehabilitation, their readjustment to social changes by the disruptions, and restoration of their personal assets and resources. Also, they enable participation in the restoration of social resources in their offline communities (Meier and Munro 2010). At the same time, individuals can request and receive, as well as send

[6] Fackler, Martin, "Japanese City's Cry Resonates Around the World", in: *The New York Times*, 6 April 2011; at: http://www.nytimes.com/2011/04/07/world/asia/07plea.html?pagewanted=all (14 September 2012): 21.

information through online social networking sites. Accessing such services would foster faster distribution of personal information by 'updating' on Facebook, and 'tweeting' and 'retweeting' on Twitter (Leidner et al. 2009; Vieweg et al. 2010).

Enabling individuals to access a variety of online resources via mobile devices not only enhances rapid and expansive risk communication but also supports empowerment and education of individuals and their communities.

5.5 Empowering and Educating Individuals and Social Groups in Disaster

Individuals who engage in risk communication transfer their experiences which influence their perceived risk in the post-impact phase. In this process, they are empowered and engaged in learning to allow them to adjust their perceived risk to restore and enhance their resilience. Thus empowerment and education of the individuals are synonymous in that building their online communities helps rebuilding their offline community.

5.5.1 Empowering and Educating Through Online Communities

Research establishes links between the experiences of populations with devastation and their community's morale and their motivation to re-engage with learning. Hence, educating individuals can empower their resilience through enhancing their knowledge and skills by building their online communities.

Case studies on Hurricane Katrina in the US in 2005 (Breeden et al. 2007) and the earthquake in Haiti 2010 (DiAquoi and Raygine 2011) show that people's experiences influenced their community morale, thus affecting their re-engagement process with learning. Initially, individuals' learning motivation was overwhelmed by the fear of uncertainty, isolation and most of all, the breakdown in risk communication (Breeden et al. 2007). Thus, educating individuals can empower their resilience by enhancing their knowledge and skills to foster their imagination and innovation.

In the pre-impact phase, an online community as a learning community facilitates engagement in learning processes for disaster training and exercises (Kendra and Wachtendorf 2006, 2007). This promotes engagement of situated learning activities under an authentic scenario that enhances innovative thinking (Ben-Ari 2005). Enhancing this thinking allows individuals to create contingency responses when they meet unexpected scenarios in disasters (Boin et al. 2004).

For instance, in the trans-impact phase of the Great East Japan earthquake, the director of a nursery school was stranded with 450 people including 71 children in

Kesennuma, Miyagi prefecture. She sent an email via her mobile phone to her son in London who 'tweeted' a rescue message which was 'retweeted' by his online social networks. Socially amplified retweet messages rippled across the globe, ending with the deputy governor of Tokyo issuing orders to the Tokyo Fire Department for immediate rescue which was completed in the third day of the impact of the earthquake and tsunami (Kahoku Online Network 2011).[7] This example shows not only that Twitter via personal mobile devices is capable of relaying critical emergency message but also that this requires the sender to be imaginative and innovative in constructing a risk communication message within the limit of 140 characters ensuring its trustworthiness. Moreover, individuals need to be aware of the resources available to them and their potential capacities.

In the post-impact phase, individuals can be empowered by engaging with collaborative and interactive learning activities, outreach, and partnership building in their online and offline communities (Kendra and Wachtendorf 2006). In the process, they transfer individual experiences into knowledge and memory (Schellong 2008). By doing so, they are able to consolidate personal experiences and knowledge by finding mutual interests for creating shared identities that will facilitate the construction of a collective perceived risk (Stallings 2005). Thus, the individuals and their communities can minimize risks arising from social competitions among social groups over accessing available social resources, thus reducing the level of risk and uncertainties (Kendra and Wachtendorf 2007). This will foster social cohesion. In other words, individuals' empowerment and education are synonymous with restoring and rebuilding individuals' resilience through building their online community for rebuilding their offline community.

5.5.2 Rebuilding Communities Through Building Online Communities

Education of individuals and social groups in the recovery phase will enhance community resilience through engaging in both online and offline communities.

Crises and disasters disrupt social systems hence individuals and communities are required to undertake adaptive processes in their lives under changing conditions in the recovery phases of disaster. Resilience can be defined as 'a process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation' after social disruptions resulting from disasters (Norris et al. 2008: 130). In this context, individuals engaging in online risk communication participate in multi-level community engagement which fosters the integration of an

[7] See "Focus, 3.11 Earthquake—Testimony/450 people isolated at the Kesennuma Central Community Centre, under the threat of raging frame, shortage of drinking water and food", in Japanese [Shoten, 3.11 Daijishin—Shogen/450 ninga koritsu, Kesennuma Chuo-kominkan/semaru moka, mizu, shokuryo kokatsu], in: *Kahoku Online Network*, 20 June 2011; at: http://www.kahoku.co.jp/spe/spe_sys1071/20110620_01.htm (19 October 2012).

individual, community and social system, hence empowering their sense of community. In this way, online communities facilitate interactions through risk communication in a variety of ways: individual factors including self-efficacy, outcome expectancy and action coping; community factors including community participation and problem articulation; and institutional factors including empowerment and trust (Johnston et al. 2012).

Johnston et al. (2012) conducted two case studies based on the Edgecumbe earthquake in 1987 and the Te Anau earthquakes in New Zealand. They found that community participation by the population could reduce anxiety. The recovery depended on how the society could organize, mobilize and coordinate a variety of social resources to support community recovery while individuals, community and the social system must complement each other (Johnston et al. 2012). In this context, engaging in online risk communication will offer, in time, moral support and facilitate rapidly and expansively online and offline community participation. The community participation by individuals can be undertaken through retraining and up-skilling (Kendra and Wachtendorf 2006, 2007). By doing so, they can adjust their skills and knowledge to meet new risks, threats and challenges to their human security in the post-disaster recovery (Shklovski et al. 2010). This can enhance their resilience to foster social cohesion in their community that may empower them, thus rebuilding and revitalizing their communities.

5.6 Conclusion

The social nature of disasters causes social disruptions intensifying risks, threats, challenges and vulnerabilities to individuals' sociocultural well-being and human security beyond traditional political and sociocultural boundaries. Particularly, individuals' human security regarding 'freedom from hazard impact' and 'freedom from fear' are threatened in the post-impact phase of disaster impacting upon their capacities to fulfil their lives. Individuals exposed to vulnerabilities engage in learning processes acquiring knowledge on how to adapt and adjust to the post-disaster environment.

Individuals' 'freedom from fear,' anxiety and uncertainty posed by on-going experiences with devastation can be enhanced when they engage in risk communications via a variety of online resources. Individuals seek information and knowledge related to feelings towards, cultural interpretation of, and types of information about risk, that changes their risk perception.

As a number of examples from the SARF have demonstrated, individuals can seek, create and share information that ripples beyond traditional political and sociocultural boundaries through online communities of Facebook, Twitter and micro-blogging.

However, a number of examples demonstrated that these online resources potentially produce negative consequences of the word-of-mouth nature such as spreading rumours, disinformation and misinformation. It is in this context that

individuals engage with learning to acquire knowledge through seeking, creating and sending trustworthy and credible information, such as the YouTube video titled *SOS from Minami Soma Mayor*.

These online resources allow individuals to diversify information sources to cope with fear and anxiety resulting from uncertainty, as well as facilitate the transformation of experiences into new knowledge and skills. Establishing such online learning communities offers diverse social and action support from different parts of the globe that assist to enhance individuals' basic human needs, health, livelihood, dignity, human rights and social justice. This fosters empowerment and education of individuals facilitating resilience of individuals and community.

Further, online risk communication can enhance our knowledge and in-depth understanding of local and global risks that support individuals' efforts so maximizing 'freedom from hazard impact' and 'freedom from fear.' This process has great potential to ameliorate human security and peace.

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Chapter 6
Beyond the Surface: The Deeper Challenge in Environmental Education—Transforming Consciousness Through Peace Environmental Education

B. Jeannie Lum

Abstract The growth of the ecology of environmental learning research programme continues to increase as research evolves in understanding how garden-based programmes can be effective in spreading awareness of the sustainability crisis. This chapter challenges the prevailing traditional approach to environmental education by proposing that the current 21st century crisis requires the infusion of a peace ecological orientation to environmental learning in order to realize sustainable transformation and a sustainable peace through education. Preliminary results of a university peace environmental course in achieving the deeper challenge of transforming human consciousness as a precondition to existential changes in lifestyle habits are reported. Narrative accounts show different types of transformation are possible in assessing the effectiveness of combining peace and environmental education as a viable critical approach for learning environmental stewardship. This chapter introduces the concept of *emergent biophilia* as a higher-order integral state of consciousness when learning is approached as a transdisciplinary process of integrating nested ecologies of environmental knowledge, participation, cultural experience, and peace values in course construction.

Keywords Consciousness · Emergent biophilia · Human development · Nested ecologies · Peace · Stewardship · Transformation

6.1 Introduction

The growth of the ecology of environmental learning field continues to expand as a cross section of individuals and groups within academia, government, businesses and non-profit organizations engage in educational programmes aimed at

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spreading awareness of the sustainability crisis and changes needed for human survival in the 21st century.[1] In the United States, the National Environmental Protection Agency's (EPA) Office of Children's Heath Protection and Environmental Education mandate to bring about public awareness 'to know s*omething* (emphasis added) about the environment issues in their communities, nationally and globally' has not led to desired outcomes with more than 100 million federally invested funds in education projects, undergraduate and graduate student fellowships, state certification programmes, the creation and dissemination of *environmental education* (EE) standards for teaching materials in formal and non-formal programmes, a national educator training programme, research and evaluation (Wray-Lake et al. 2008). 'The message of personal responsibility, involvement and action, exhibiting stewardship behaviors, and ownership of the major sources of pollution (nonpoint source) in this country today has not been widely received and understood' (Potter 2010: 25).

The perplexing problem for educators is not just how to educate for environmental awareness but also what materials to use that will reorient or transform students and public perceptions and their lifestyle habits in becoming stewards of the earth. The definition of EE that was developed by EPA in 1992 is:

> Increasing public awareness and knowledge about environmental issues and providing the skills necessary to make informed environmental decisions and to take responsible actions. It is based on objective and scientifically sound information. It does not advocate a particular viewpoint or a course of action. It teaches individuals how to weigh various sides of an issue through critical thinking and it enhances their own problem-solving and decision making skills (EPA 1992: 2).

The evolution of the ecology field since Haeckel coined the term in 1966 (see Chap. 1) has resulted in a collection of sub-disciplines that focus on scientific research on the behaviour and adaptation of human populations, conservation of ecosystems, and the functional relationship between human organisms and other biological living systems. However, with the 21st century environmental crisis, the contemporary sustainability ethos round the globe necessitates fundamental changes in human lifestyles, the realization of a planetary consciousness, and the engendering of a new ethic of care for all human life and our natural resources

[1] The *2010 State of the World Report* from The Worldwatch Institute documented staggering figures tracking environmental changes over half a century. Environmental degradation stood as the highest priority of world problems that severely impacts the survival of the human race (Assadourian 2010). An UN report of 7 June 2012 on the environment emphatically warns that the earth's physical boundaries critical to human survival 'are being pushed towards their biophysical limits… As human pressures on the earth … accelerate, several critical global, regional and local thresholds are close or have been exceeded … Once these have been passed, abrupt and possibly irreversible changes to the life-support functions of the planet are likely to occur, with significant adverse implications for human well-being' ("UN warns environment is at tipping point," in: *USA Today*, 6 June 2012: 1).

makes the task of course creation evermore complex.[2] 'Environmental ecology' goes beyond the lifesystems in the biosphere to 'social ecology' (Brookchin 2005).

> Social ecology is based on the conviction that nearly all of our present ecological problems originate in deep-seated social problems. It follows, from this view, that these ecological problems cannot be understood, let alone solved, without a careful understanding of our existing society and the irrationalities that dominate it. To make this point more concrete: economic, ethnic, cultural, and gender conflicts, among many others, lie at the core of the most serious ecological dislocations we face today—apart, to be sure, from those that are produced by natural catastrophes (Bookchin 2007: 19).

6.2 Environmental Education in the United States

In the United States, environmental education has been slow to accommodate real world changes. Yet, elementary schools and middle and high school science courses that integrate outdoor activities in garden based learning is receiving national attention.[3] Today, the interest in school gardens comprises a cross section of individuals and groups within academia, government, businesses and non-profit organizations often soliciting grants geared towards health and nutrition. Leading the way, the First Lady, Michelle Obama, continues her initiatives to fight child obesity and improve nutrition in schools with programmes like *Let's Move*, the *White House Kitchen Garden*, the *Healthy, Hunger-Free Kids Act* of 2010. Famous chefs have initiated cooking classes in schools that educate children to develop good eating habits by learning how to produce, appreciate, and cook healthy meals that come fresh from the garden.[4] Famous entertainers have performed free and dedicated their concerts to raise funds for school based gardening

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[2] In 1992, the Union of Concerned Scientists issued this warning: 'Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on critical resources. If not checked, many of our current practices put at serious risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living world that it will be unable to sustain life in the manner that we know. Fundamental changes are urgent if we are to avoid the collision our recent course will bring about' (http://www.un.org/popin/icpd/conference/ngo/940909224555.html).

[3] The U.S. Department of education, the National Science Foundation and other partnership agencies offer the Science Technology, Engineering, and Mathematics (STEM) Education Coalition grants in which gardening programs may find funding if they combine science education with gardening practices. STEM initiatives in funding is a result of the U.S. falling in world-wide status in students who graduate in these fields.

[4] A U.S. national example is Chef Alice Waters owner of Chez Panisse Restaurant in Berkeley California. Waters pioneered the Edible Schoolyard program that introduces students into all aspects of locally grown organic gardening in the public schools where they grow, prepare, cook and share food. A local icon, Chef Alan Wong, is considered the Godfather of Hawaiian Cuisine and engages in local fundraisers for charity organizations and supporter of the Kapiolani Community College Culinary Arts Program of which he is a graduate.

programmes.[5] In 2009 the Centers for Disease Control and Prevention identified farm-to-school programmes as an effective vehicle for improving the quality of student meals and enhancing nutrition education (Wood 2011).[6] Though not fully implemented to this day, in 1995, California's State School Superintendent Delanie Eastin mandated 'a garden in every school.' Yet, as prolific as these non-profit and federal and state partnership programmes may be to educate public and private school teachers for developing school gardens, there is a gap among those who are well versed in agricultural knowledge and gardening practices, others who know only how to teach their specialized knowledge in the sciences and many who outside of the science field see the need to address the current crisis but do not know how to integrate 'environmentalism' into their subject matter (e.g. math, social studies, languages, literature, etc., Guns 2006).[7] Nation-wide, at the university level, within the broad mission of sustainability, we find courses cropping up everywhere throughout the natural, social science disciplines and professional schools with agricultural reformists, environmentalists, and educators wanting to bridge the gap between environmental, social, and adaptive learning pedagogies from the sciences (e.g. natural resources management, resilience perspectives in social-ecological systems, civic ecology and adaptive co-management strategies) with current educational learning pedagogies found in colleges of education that promote social interaction, situated learning, authentic, experiential, place-based, inquiry-based, and project-based environmental practices (Krasny et al. 2009; Krasny and Tidball 2009; Tidball and Krasny 2011). The problems in educating for an ecological consciousness become even more complicated when acknowledging that the topics and approaches in teaching environmental ecology courses cannot avoid the integration of perspectives from multiple disciplines. Teachers must also accept that they need to constantly update and remake their core curriculum in a period where there are fundamental paradigm shifts in the discovery of new knowledge and the emergence of new unforeseen problems. The need to accommodate mixed grade levels, the linking of theories taught in-class to outdoor natural settings, and the reorientation of local, sometimes provincial) place-based schooling to global concerns add to the challenges in teaching this type of course.

In this chapter, the piloting of an peace environmental education course at the University of Hawai'i and post-graduation survey results are presented that investigate the following questions: The primary research question is: Can an

[5] Hawai'i local and world renown musician, Jack Johnson and his wife founded the non-profit Kokua Hawai'i Foundation supports educational grants and programs in environmental education for Hawai'i schools. Johnson hosts an annual Kokua Festival as the major fundraiser event that brings together environmental organizations, eco-friendly businesses, musicians, artists, teachers, and community leaders to support environmental education in Hawai'i.

[6] Wood, R.J., Farm to School and the Child Nutrition Act Improving School Meals Through Advocating Federal Support For Farm-To-School Program. Robert Wood Johnson Foundation, Published: 05/31/2011 http://www.rwjf.org/en/research-publications/find-rwjf-research/2011/05/farm-to-school-and-the-child-nutrition-act.html.

[7] Farm to School Meeting, The Kohala Project, Hawaii Island, report, 22 February12.

environmental education course taught from a peace education perspective transform human consciousness and succeed in creating persons who become stewards of the earth? Secondary research questions entail: What is the working definition or characterization of peace consciousness? What kind of content, design, or pedagogical teaching methods would be used in an environmental education course that might achieve these results? What research methods are appropriate for researching post-graduation learning linked to programme and course evaluations? What are the criteria or qualifications that determine different aspects or levels of transformation in human consciousness?

Research results of a survey taken by graduates 2 years following their enrollment in an experimental peace environmental education course with a general focus on educating for the cultivation of peace gardens is a viable approach to creating an integrated ''peace environmental consciousness' in students, youth, and adults that serves the broader mission of environmental sustainability.

6.3 Conceptual Framework

6.3.1 Historical Context of Peace Education Linked to Environmental Ecology in the 1990s

A world-wide movement began in 1989 at the International Congress on *Peace in the Minds of Men* in Yamoussoukro, Cote d'Ivoire, called UNESCO's 'Culture of Peace Programme' (UNGA 1998). Following the end of the Cold War, a series of meetings was called about the mission of the United Nations that questioned the need for organizational change, improved communications among its various departments, and more effective handling of operations abroad given changes in the global landscape. The UN began to scale down and encourage more comprehensive action for the new millennium, particularly emphasizing the important role of education (UNESCO 1997). An example was the redefinition of the traditional UN forces peace*keeping* mission to peace *building* as an intervention strategy providing aid to war-torn societies. The redirection of its military defense efforts allowed more *engagement* in the processes of creative renewal and the reconstruction of *cultures of peace* in countries affected by war. Just as the Union of Concerned Scientists had stressed the need for a *new ethic,* UN members agreed that fundamental to the success of the cultures of peace endeavor required the greater challenge—the change of 'the hearts and minds of men' who were steeped in civilizations whose ideological perspectives and cultural ways of life not only justified war and violence as strategies for achieving peace but also the economic means and social cultural supporting ideologies and lifestyle habits. The carelessness of corporate profit minded *laissez-faire* destruction of natural resources encouraged a wasteful materialistic consumptive lifestyle that symbolized aspects of a *culture of war* mentality that had to change. Peace education was looked upon

to meet the forthcoming millennium goal of ecological sustainability by *transforming human consciousness* in ways of thinking and habits of being that would lead to real changes in *being* and *lifestyle habits*.

Among educators, there is often a lot of confusion about the meaning and applications of studies and research in peace education; even more so with this recent expansion of the field from a political centre to encompass social, cultural, ecological, and environmental concerns. Barriers to overcoming public perceptions about the field of peace education are buried in the history of the establishment of the field of peace studies. Peace education was academically recognized as a subfield of the social sciences generally referring to programmes in peace studies that emerged in political sciences, sociology, and future studies departments. These were not at all associated or linked to Colleges of Education and teacher education programmes. With the creation of the UNESCO 'Culture of Peace Programme', the operative definition of 'peace' was transfigured beyond the traditional *negative peace* and *positive peace* formulations that had dominated the field of peace studies for several decades (Galtung 1969a; 1967b, Chap. 1). In seeing peace education as a vehicle for transforming cultures, this did not eliminate the important need to recognize explicit and implicit forms of violence and their elimination as an essential step in achieving peace; but, by taking the emphasis off contexts of violence as a precondition for peace action, this made peace a valued educational end in itself. What *end states of being* belong to the family of experiences connected to *peace?* How are these achieved through education? This changed the educational landscape for peace educators to reach outside contexts of violence and confines of conflict resolution or war in studying and researching pedagogies of peace. Thus, peace gardens, their function and educational possibilities, evolved with the environmental education movement of the 1990s and push for sustainability.

Peace gardens have popularly been directly or indirectly thought about in relation to wartime events. At the suggestion of creating peace gardens in schools, teachers and legislatures look bewildered. They often think of peace gardens created to honor and memorialize fallen victims and heroes of war. Yet, another association of peace gardens in American history was during World War I and II when the U.S. government supported the local development of victory gardens nation-wide. These were created to help supplement dwindling food supplies and it has been estimated that over 20 million backyard and school gardens were in operation. Public perceptions are also politically linked to the student led forums, protests, and marches of the 1960s on university campuses (Stomfay-Stitz 2000). These cultural connotations carry over in first level impressions and blur the connections of peace gardens to the current 21st century sustainability environmental movement (Lum, in press).

6.3.2 Peace Consciousness

'Peace consciousness' defined in the context of gardening involves the cultivation of five human capacities and guiding intentions: (1) learning how to find and experience peace within oneself; (2) learning how to manage peaceful relations with others and relations to all living creatures in ways that are harmless and mutually beneficial; (3) learning how to live with and within one's natural and manmade environment and the planet earth that sustains an ecological balance; (4) learning how to experience ones identity radically interconnected (Selby 2002) within a global community engendering global responsibility; and (5) achieving a universal spiritual cosmic awareness. Other peace educators (Sauvé and Orellana 2004; Brenes-Castro 2004; Reardon 1989) have developed frameworks spanning three similar areas beginning with a core self and inner peace, peace with others, and peace with nature. Here, I expand on two additional dimensions. A fourth dimension of global identity proposes that education about peace must link local life experiences of individuals as universal members of humanity. A fifth dimension of spiritual cosmic awareness proposes that we must understand the interrelatedness of human activity with other life systems on earth and planetary changes in the solar system.

The term 'peace consciousness' conceptually is also aligned with the integrated consciousness of four ecologies of identity in Wimberly's theory of *nested ecologies.* Wimberly (2009) sees the environment represented in a hierarchy of nested ecologies—the personal, socio-cultural, environmental and cosmic ecologies. Hierarchy is not defined in the sense of top down or bottom up structured relationships, but rather draws from Maslow's human developmental model indicating prioritized levels of need that define the optimal functioning in being human. These four primary forms of ecology are interdependent—the personal focuses on an ecology of the self identity; the socio-cultural is family and community oriented; the environmental reflects the natural ecosystems; and the cosmic relates to the unknown, the transcendent and energies in the universal of which all planetary life depends. Wimberly sees the functioning of each domain interconnected and interdependent in its support of individuals and subsystems of healthy sustainable communities:

> Healthy and sustainable communities are constantly conserving and improving natural environments, continually creating and improving built and social environments, and expanding those community resources required to insure that current and future residents will be able to perpetually extend mutual support to one another and realize their maximum potential in performing all the functions of life (Wimberly and Haught 2009: 122).
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> An ecosystem that persists over time; remains productive; exhibits biodiversity, resilience, and adaptivity to change; and that can be expected to continue doing so into the foreseeable future (Wimberly and Haught 2009: 128).

6.3.3 *Emergent Biophilia: The Biophilia Hypothesis and Intentionality*

Cultivating a peace consciousness takes ecology to a higher-level consciousness of intentionality (Searle 1969; Lum 2008) in meaning and sense-making beyond the physical, functional and social interactionist frameworks, nevertheless, taking these into account. Peace consciousness in this sense is an *emergent intentional integral state of being* that merges the four nested ecologies identified above. Here the concept of 'emergent biophilia' (Burgess and Mayer-Smith 2011) is expanded in contrast to Tidball's notion expanding upon, yet in contrast to Tidball's notion of *urgent biophilia.* The *biophilia hypothesis* first proposed by E.O. Wilson is defined as "the innately emotional affiliation of human beings to other living organisms" (Wilson 1984: 31). Tidball (2012) "suggests that when humans, faced with a disaster, as individuals and as communities and populations, seek engagement with nature to further their efforts to summon and demonstrate resilience in the face of a crisis," they exemplify urgent biophilia. The conditions to which individuals respond require a sense of urgency in their need for survival. This supports the naturalistic premises put forth by Wilson that biophilia is a genetic biological trait inherent in human beings and their evolutionary development. Biophilia is found in its positive and negative (biophobia) human expression at every level of linguistic, social, and cultural representation, e.g. in human affiliation with fauna and flora (Shepard 1993), linguistic idioms, similie, and metaphors, and generated meanings symbolic in culture and the arts (Lawrence 1993). There are different opposing positions (Diamond 1993), if not questioning the limitations it imposes (Orr 1993; Wimberly 2009); notwithstanding, the importance of its innate implications for educators is vitally relevant to the instructional practices used in learning situations. Of particular significance, is Wilson's further claim that biophilia is "mediated by rules of prepared and counterprepared learning—the tendency to learn or resist learning certain responses as opposed to others….not a single instinct but a complex of learning rules that can be teased apart and analyzed individually" (Wilson 1984: 33). The important question, as seen above, thus, not only has to do with how to educate for ecological consciousness, but furthermore, whether the evolution of the modern age of materialism, technology, consumption and concrete metropolitan and urban jungles have been powerful enough to diminish or even completely erase this trait.

Ulrich (1993) surveys the empirical evidence on *biologically prepared learning* and categorizes three areas of research: positive and negative responses; restorative or stress recovery responses; and enhanced higher order cognitive functioning. The first researches human biological responses to natural stimuli (e.g., pictures of natural landscapes, snakes and spiders). The second functional-evolutionary perspective approach identifies conditions of health and well-being (e.g., recharging of energy or adaptive behaviour to demanding situations; stress or anxiety reduction to viewing nature or outdoor recreational experiences). The third cognitive approach looks at human engagement in non-urgent tasks in natural settings measuring higher-order

thinking, creativity, (e.g., preserving nature for workplace productivity). The fundamental premise underlying this research programme is that there are essential experiences for human survival that may recover the desire, and hence, motivate us toward action in the preservation/conservation of the natural environment.

'Emergent biophilia' suggested here, takes a neutral and indifferent position to the genetic perspective. That is, it does not hold that we have biophilia genes of which some humans may be more predisposed to adaptive biologically prepared learning rules than others. Nor does it hold that the rationale for engaging in environmentalism is based on a fundamental biological need for survival. Rather, it holds that human engagement with nature spans a repertoire of cultural needs in indeterminable meaningful ways that potentially trump utilitarian based physical needs. Thus, any educational approach wishing to enlist a transformation of human attitudes and behaviours requires an *educative cultivation* of knowledge and sensibilities through the integration of cognitive, moral, psychological, emotional, aesthetic, and physical experiences. Emergent biophilia, as the term is used, might be seen under this third approach, in that the condition of non-urgency is implied; however, it expands beyond the functional-evolutionary paradigm to embrace post-modern cultural perspectives, studies in consciousness and intentionality (Searle 1969) and critical reflection (Mezirow 1991) in its framework of analysis.

'Emergent' refers to a transformed state of human consciousness that emerges as a consequence of the integration of a collection of elements that require a reflective and critical stance to the invisible elements compounded in its new configuration. In the debate about the nature of consciousness, philosopher John Searle describes this phenomenon using the liquidity of water as an example:

> Consciousness is a higher-level or emergent property of the brain in the utterly harmless sense of 'higher-level' or 'emergent' in which solidity is a higher-level emergent property of H_2O molecules when they are in a lattice structure (ice), and liquidity is similarly a higher-level emergent property of H_2O molecules when they are, roughly speaking, rolling around on each other (water). Consciousness is a mental, and therefore physical, property of the brain in the sense in which liquidity is a property of systems of molecules (Searle 1992: 14).

Thus, an emergent property manifests itself in form and function whereby its trace elements are indistinguishable. Human beings do not experience the elemental properties or interactions of H_2O in liquidity in their conscious awareness. We must be educated and discover or learn about them under their nascent conditions. Secondly, just as the form and functions of water in its transformed liquid state is realized within a conscious network of intentional states—a multitude of beliefs, practices, and cultural associations—so do our conscious intentional states exist in a transformed state that transcends the unconscious limitations of its prior elements and conditions (Searle 1992). That said, the reduction of cultural values is counterintuitive to the generative forces needed in the creation of cultures of peace that can overcome the pitfalls of modernity. Rather, emergent biophilia requires a wholistic peace environmental approach whereby the transformation of human consciousness into a peace ecological consciousness may be linked to human biology (bio-cultural theory) but without some form of education and

engaged meaningful practice, it is unlikely that action derived from instinct alone would achieve the transformation to a 'peace consciousness' so desired.

6.3.4 Methodological Framework

The methodological framework to assess the respondents' critical and perspective states of transformation is adopted from Mezirow's (1991) levels of assessment in critical reflection. Mezirow dissects different aspects of learning and reflective processes that affect transformation of a person's perspective and action. Type 1, *instrumental reflection* involves a "process of learning to control and manipulate the environment or other people" (Mezirow 1991: 8). It does not require any change in one's assumptions or beliefs, rather judgment and problem solving is based on prior perspectives that one already has when entering the course. Change of views or habits is still possible, but oriented toward self-validation or confirmation of a set of beliefs and values that are a priori in place. Change may occur through adoption of new ideas or practices based on preexisting meaning structures and perspective principles. Type 2, *communicative reflection* and learning "focuses on achieving coherence" understanding meaning and making sense of new information. The adoption of new ideas is a result of questioning substantive existing beliefs. Change occurs in the process of reasoning about a corpus of beliefs and replacing or adding new ideas in the process of reconstruction. Type 3, *perspective transformation*, a higher order capacity in reflection and learning reflects what might be consider the ultimate level in achieving a 'peace consciousness' that entails environmental awareness, ecological sensitivity that leads to fundamental changes in one's behavior, perceptions and lifestyle habits. *Critical reflection* "challenges the validity of *presuppositions* in prior learning (Mezirow 1991: 12) or basic premises in our assumptive beliefs. The process of transformation takes into account our taken-for-granted beliefs, habits, ways of thinking and being in undergoing substantial transformation towards the development of new ways of experiencing and being in the world. "Critical reflection is not concerned with the how or the how-to of action but with the why, the reasons for and consequences of what we do" (Mezirow 1991: 13).

> Perspective transformation is a process of becoming critically aware of how and why our presuppositions have come to constrain the way we perceive, understand, and feel about our world; of reformulating these assumptions to permit a more inclusive, discriminating, permeable, and integrative perspective; and of making decisions or otherwise acting upon these new understandings (Mezirow 1991: 14).

Below in the discussion of results, examples of three student cases are provided that illustrate these degrees of transformation from *instrumental* = pragmatic; *communicative* = substantial; and *perspective* = critical. Intentionally these levels are not structured from low to high because the analysis of consciousness is considered intertwined, much like the way in which Wimberly's ecologies are nested.

In this sense, states of transformation are nested *identity* states, in five dimensions: identity with self, with others, with the environment, the global and cosmological.

6.4 The Peace Environmental Education Course

The 'Peace Environmental Education' course was originally introduced as an experimental course in the College of Education at the University of Hawai'i designed to create awareness in education majors about the environmental crisis with a focused activity centered around the concept of peace gardens. Its goal was to have students (principals, teachers, graduate education majors) incorporate environmental issues in their teaching Kindergarten-12th grade curriculum or in their future professional career. The paradigm shift in the field of peace education steered by the 'culture of peace' movement was a clear match with environmental education and the budding interest in sustainability at the university level in 2006. However, the political reality was that 'peace education' as a name for a course continues to appear vague in colleges of education. The name 'environmental education' was used because it was already listed on the department's roster, but not taught since the 1970s.

How does the content of this peace environmental education course likely differ from what is more commonly perceived as a typical environmental education course? What does a peace perspective bring to the course that, in this case, enhances the chances of transforming student consciousness towards becoming stewards of the earth in ways where more traditional approaches have failed? In late 19th century America, with the advent of modern industrialization and the building of the railroad, the environmental movement evolved from a conservationist orientation to protect the pristine beauty of natural landscapes, parks, and designated lands from destruction for the leisurely enjoyment of the wealthy. By the mid 20th century, environmentalist, peace activists and educators sought to preserve the environment and protect human life from the pollution brought on through industrial pollution and nuclear warfare. Rachel Carlson's (1962) famous book, *Silent Spring*, raised awareness of the use of DDT and its impact in altering human and environmental life systems. The traditional approach to environmental education questions the impact of human actions on the environment and the capacity of the earth to naturally replenish itself, hence assuming natural resources can sustain human life *ad infinitum*. It defines and sees problems from the perspective of the natural sciences, and as mentioned above, sees environmental education appropriately taught in natural and biological science classes. The extension to gardening as a site for outdoor experimentation frequently translates human ecology to issues about human health and nutritional wellness. It is a functional relationship that assesses the value and consequences of human actions (more often industry driven by economic values) taken on an objective natural world of which humans depend for their survival. The two, humanity and natural environment, are seen as *naturally* interdependent.

Today's 21st century challenges to this long established tradition sees environmental education with a broader and deeper multidimensional lense that necessitates the integration of transdisciplinary perspectives and approaches in education. In 1992, the *Union of Concern Scientists* (UCS) issued a statement warning:

> Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on critical resources. If not checked, many of our current practices put at serious risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living world that it will be unable to sustain life in the manner that we know. Fundamental changes are urgent if we are to avoid the collision our recent course will bring about.[8]

The peace environmental course adopts a critical perspective on the tradition of the environmental movement as well as Western dominated traditional pedagogies and practices in education. It's historical framework for examining cultural assumptions about human ecology and the environment are drawn from Edmund O'Sullivan's (1999) transformative learning perspective and transformative learning practices (O'Sullivan and Taylor 2004). Additional transdisciplinary strategies and values are adapted from the UNESCO *Culture of Peace Programme* (CPP) recognizing the need to bridge theory with practice, indoor with outdoor classroom learning, understanding of diverse cultures and acknowledging the impact of cultural values as a vital aspect of the learning process. In particular, the hidden assumptions underlying the dominant ethic of materialism, consumption, profit-mindedness that sees humans as a superior species needing to control, dominant, and use the earth's natural resources purely for its own advantage must be supplanted with universal values of peace, social justice, and environmental sustainability that could benefit all and not just the privileged few (International Decade for a Culture of Peace, U.N. General Assembly A/RES/53/25). The unconventional nature of the peace environmental course is that it infuses universal peace values in the education and practices of gardening and tending to the environment. The revitalization of the concept behind peace gardens is based on a historical account of the value that gardening has had in the survival of humanity and flourishing of human civilizations. It includes a comprehensive vision for peace in schooling for the 21st century (Lum in press) guided by five principles woven in to school culture, curriculum integration, pedagogy, and educational practice is all areas of schooling: (1) Peace within, (2) Peace in relations with others and all life systems, (3) Peace with the natural and fabricated environment, (4) Peace as an interconnected part of the global community and; (5) Peace in spiritual awareness of one's place in the cosmos. An eclectic pedagogical approach supports the use of a variety of instructional strategies that is determined by the appropriateness for a given learning situation, the cultural context, the learning aims, the available resources, and the capacity of the learner. In this course service

[8] See footnote 2.

learning (Kaye 2010) is essential in providing a community project where students can focus their creative energies and engage in experiential learning.

What follows is the identification of some of the more salient elements of these pedagogies, their translation into the peace environmental education course content, assignments, and instructional strategies (UNGA 1999).

6.4.1 Education for All and Everywhere

Essential to the programme is *Education for all*—an intergenerational CPP mandate that education extends beyond formal institutions through all walks of life, beyond children to all ages, beyond local and national boundaries to a global world community, beyond cultural limitations to figuring out communicative strategies that can make everyone a participant in creating cultures of peace on a universal scale.

> By focusing on our children, we implicitly pledge ourselves to *education for all*, a concept that combines formal and non-formal education and seeks to promote quality basic education that is grounded upon the universal values—and practice—of a culture of peace and non-violence. Such a task must engage every one of our fellow citizens in all dimensions of life: in schools, workplaces, and the home; at the national and at the community levels; in the public, private and voluntary sectors. Above all, children themselves must be empowered to become actors, not mere spectators, in shaping their own visions and futures…. (Mainstreaming 2002).

The course was open to any graduate student or upper division undergraduate, from any major area of study, to any age, gender, and ethnicity. It is also open to any public citizen as an unclassified university enrolled student.

The course was held inside the classroom at the University of Hawai'i and outdoors at several sites around the island of Oahu with one excursion to the island of Kaua'i, field trips to four Hawaiian sacred sites, two Hawaiian Heritage sites, the beach, the University Lab School, the University College of Tropical Agricultural and Human Resources Urban Garden Center Master Gardener Program, and attendance of a series of four films and talks by the nationally award winning non-profit organization Beach Environmental Awareness Campaign Hawai'i (B.E.A.C.H.).

6.4.2 Transdisciplinarity

Peace education is a transdisciplinary discipline that recognizes the tradition and historical evolution from mono-disciplinary to cross-disciplinary, multi-disciplinary, and interdisciplinary approaches in academic studies and research. It honours the inclusiveness of all of these approaches in understanding the problems and steps for transforming cultures. Cultural transformation places the responsibility and control for change in the hands of those affected by change, empowering the people 'on the ground' whose livelihood is at stake and who *know* the

meanings and hidden implications of actions less apparent to distant consultants or nonlocal residents. Integration of theory-practice-application-ethics is practiced at each step of the process through dialogue leading to socially just and fair outcomes for all. Transdisciplinarity enables a new vision for establishing a culture of peace based on the universal values of "respect for life, liberty, justice, solidarity, tolerance, human rights and equality between men and women" (Mainstreaming 2002: 2). *Transforming* cultures is not returning to where one was before, blindly accepting conditions due to personal familiarity or comfort zones that resist change, least the same problems will reoccur again. New visions that overcome unhealthy, repressive, discriminatory, unfair, unequal human conditions require fresh ideas, making interconnections, and allowing the *never before heard of* and *never before seen* be taken as legitimate possibilities.

The peace environmental education course taps different disciplinary perspectives on environmental issues in course content to develop a transdisciplinary mindfulness in critical thinking, problem posing, and envisioning new ways of looking at problems. *In-class*: students and the teacher are treated with equal respect that represents diverse interests and disciplinary backgrounds (in this class, art education, urban development, English, social studies). Students are given a teaching role in leading class discussions for readings, reporting on the progress of their projects for shared feedback, and conducting a final presentation of their project. One of the course assignments is a service learning project that includes research and volunteer work for an NGO or environmental community organization that centres on environmental restoration activities, education of the public, and political action in support of an environmental issue in the local community. Representatives of these NGO's adopt team teaching strategies. For example, the head of the *Beach Environmental Awareness Campaign Hawaii* (B.E.A.C.H.) spoke in a month long series that included films that were open to the public (arranged by the instructor). Two guest scholar/researchers, one from environmental studies and another who developed global education curriculum were invited to speak about their research. Class *conversations* were open and lively.

Other cultural perspectives were presented about the environment in outdoor classes. In this case, a grant was received for outings managed by an eco-tour company to visit Hawaiian sacred sites around the island of Oahu. The eco-tour guides were the teacher experts because they had knowledge of the historical events, persons, significance of the cultural meanings and symbolism surrounding the declaration of these landmarks unfamiliar to the instructor. The instructor was equally a learner who could adapt this information to later course offerings. For example, in-class presentations on the research and theoretical perspectives about the impact of global warming and natural resource management on the individuals and society becomes *real* to students when the class follows with a trip to the seashore, participates in beach cleanup, sees the degradation of the coral reef and marine life and then talks to local fisherman about the consequential loss of the means of their livelihood. Noticing that the price of sashimi rises, a traditional staple for island family celebrations and holidays and is disappearing from the dinner table alerts one to the global crises. Learning to sort the debris or Coca-Cola

bottle caps written in an undecipherable foreign language filling the stomachs of dead seagulls tells stories that leave an impression more impactful than theory alone can do.

6.4.3 Building Trust, Empathy, Respect and Understanding Among Differences and Cultures

Peace education aims to build "trust and understanding among and between different cultures and civilizations, as well as nations, communities and individuals" (Mainstreaming 2002: 4). An example, is the visit to the sacred site of the Kukaniloko Birthing Stones, where only high ranking Hawaiian ali'i (royalty) came to give birth to their sons and daughters witnessed only by other island tribal chiefs. Seeing how the shapes of stones had worn away since the first birth in 1,100 AD indicated the location and positioning of women in birthing. In the far distance is a view of the mountain range that depicts the shape of a woman in a reposed position, a story known only by *kamaina* (locals). Knowledge about what this area was envisioned to have looked like in the past, unlike the dry unfertile, barren, red clay soil that it is now, surrounded by abandoned pineapple fields, enlarged students' sensitivity to the life giving spiritual relationship between humans, the rocks and the land. Such experiences helped raise awareness of how the indigenous Hawaiian natives lived in a sustainable relationship with the *ahupua'a* (self-sustaining divisions of land running from mountains to the sea) maintaining the custom of taking only what was needed in order to leave a share for others in the division and use of agricultural lands that secured cohabitation based on the value of mutual respect for the land and its people. Students see their local space come alive with meaning and come to value its significance through the eyes of others whose ancestors continue to protest the colonization of their lands. Students now drive through space and time in landscapes of historicized meaning that before went unnoticed. They see what their own species has done through modernization and the sensibility of sacredness that has been lost in their relationship with their environment and their own personal inner selves. Their values and sensibilities for the land have changed and this directly impacts their life experiences, their exchanges with others, the environment, and identity in space and time.

6.4.4 Student Generated Projects

The focus of the course is on students creating peace gardens because it gives them a project where they can bring to bear all of their learning-mentally, emotionally, and physically—knowledge and experiences that are creatively centered. Students generate their own ideas in how to incorporate their personal and professional

interests in their project that gives them personal value and offers value to others. One example of a final student project was the creation of a garden in a small rectangular patch of land (4 × 20 feet) on the ground level of her two-story rented apartment building. Jennifer had never thought of doing this before, in fact she didn't know any of her neighbours having lived there for over a year. She decided to just do it and paid for all of the materials herself. To her surprise, she found herself greeted by other neighbours who began commenting on the garden as they passed. Eventually, some began helping her plant. This small plot became a place that nurtured social relationships, helped build a sense of community, and brought inner peace to Jennifer in her experience of giving without expectation of receiving from others. Another student, Carey, following our class visit to the University Lab School, created a peace garden design for the school grounds with the input of the 3rd graders. This was their first effort to plant a garden. Today, the entire school centers its curriculum and school activities in their surrounding peace garden. It has an aquaponics corner, the butterfly garden, the container vegetable gardens, the vertical garden experiment using rain gutters, the composting bin, etc. Once a year, the school conducts an open house and opens it up to the community as young children act as docents educating the public about their sustainable peace gardens. Katie, working on her master's degree, created a curriculum booklet on basic gardening for middle school age students. And Brad selected a renowned environmental artist whose work he admired and infused his art into a curriculum art lesson on natural landscapes.

6.5 Methodology

Over the past decade evaluation of academic programmes in higher education in the United States have turned attention to questioning whether a college education makes any substantial meaningful difference to its graduates. What happens to students after they receive a degree and has their postsecondary education helped them reach their career goals? Today, in times when a perilous economy results in such high unemployment rates and scarce jobs, parents question whether a college degree is worth it or is climbing the ladder through work experience more profitable in 'making a living'. Putting aside the persistent debates about whether a college education is just about enabling students to get a job or create a meaningful life and the current debates about whether educational institutions should be run like a business; the recent infusion of college programme evaluations are no doubt, likewise, economically driven. The point at issue is that while individual course evaluations may tell us something about what students liked or disliked about a course or instructor, it does not tell us what the potential long-term impact of a course may have on a person's personal or professional life. Did they learn anything of lasting value? If it didn't, why offer it? With the skyrocketing costs of a college education, such measures are sought to further justify the value of degree granting programmes.

One of the main difficulties with this type of assessment is keeping track of students once they graduate and, as with any survey, whether the student will respond when contacted. A second difficulty is whether the same conditions in implementation need apply. For example, anonymity of students and post-grade releasing of the student evaluations to instructors are supposed to avoid fear of retaliation from a teacher if they know who the student is who gave any negative evaluation. In post-graduation assessments confidentiality is not seen as critical because there is no grade pending that could be affected negatively by the instructor in knowing the identity of the student. Any relationship of power is no longer in play, unless a student might ask for a letter of recommendation or reference sometime along their future career path. Even so, there is a further assumption that neither a student would ask for a letter of reference from an instructor whom they did not like and similarly, nor would an instructor accept a request to provide a letter of recommendation for a student they felt in disfavour. In fact, in the teaching profession, it is often this later mature reflection when a student finds him or her self in the 'real world' that such evaluations really matter beyond the immediacy of 'getting the grade'.

But what kind of questions should be posed in this case? What form should they take? Are surveys where students fill in the bubble constraining? Are Likert scales adequate in measuring transformations in consciousness? Hmmm, "On a scale of 1–5 with 1 being low and 5 being high, how much would you say your consciousness was transformed?" Does that really tell us anything? Should there be a mix of quantitative and qualitative questions? Should these be closed or open-ended questions? What qualifies as an adequate *measure* or *data* on post-graduation outcomes? A scan of articles about post-graduation data finds that in general many findings are based on economic interests in employment and job-fit. Are students employed in the career for which they studied? Did their college education get them a job? Are they working part-time at McDonalds having invested $100,000 in tuition to get an engineering degree?

Transformational forms of reflection are best represented in narrative accounts provided by subject praticipants through researcher qualitative data gathering techniques written, oral, and visual. Paul Ricoeur (1995) believes that narrative is a way in which people produce an identity, in the telling of the story, beyond the actual facts of the story. Narratives can account for change over time. Stories provide a human "landscape of consciousness" within which individuals think, feel and come to know alongside a "landscape of action" where intentions are constructed, goals are determined, and creative actions are performed (Bruner 1985). Narratives allow individuals to make their meanings about their experiences in memory of the past and carry them over into their immediate circumstances and visions of the future (Boulding 1988). Narrative accounts are able to reveal individuals' conscious reflections on their lives and meta-level reflections on their own interpretation of their reflections. It is more often that retrospectively, individuals give meaning to events in their lives (Polkinghorne 1988, 1991). Similarly, as practiced in ethnographic research, it is often that theories are adjusted or sought to explain the results found after preliminary data analysis.

Analyzing data can be a back and forth process of discovering emergent meaning and searching for theories that fit or adequately contextualize the data in a research programme or body of literature out of which one can extrapolate, make sense, or expand their findings. Narrative accounts provide both descriptive and explanatory analyses over a series of intervening interviews (Clandinin and Connelly 2000). The challenge here is the phrasing of a question or questions that could illicit an adequate narrative response from which the researcher could identify different reflective levels of change and transformation in student consciousness through an email questionnaire.

6.5.1 Subjects

In this pilot study a total of nine students were emailed questionnaires with five questions. Two no longer had the same email address and the emails were bumped back. Seven students returned their questionnaires. Of the seven, four were females, two Caucasian and two Pacific Islanders between the ages of 25–45; three were male; one Caucasian over 60 from Canada, one visiting student from Japan in his 50s, and one Korean American in his 40s. Five students were education majors, the visiting student was a middle school teacher from Japan taking his sabbatical, and one female majored in French.

6.5.2 Questionnaire

The questionnaire was comprised of five open-ended questions. (1) What did you learn in this class that you believe was valuable to your own personal growth and development? (2) Did this class raise your consciousness in thinking about the environment and ecology? (3) Did you feel that since this course you have changed or transformed your way of thinking, being, or lifestyle habits in any way? If so, please describe in as much detail as possible what that transformative effect has been (e.g. on your view of the world, in your relations with others, in your interaction with the environment, in your daily living, in your purchases, in gardening, in your participation with organizations associated with ecology or sustainable goals, community participation, civic responsibility, engaging in environmental activities, volunteer work, creating an environmental related business, furthering your education, in your sensitivity to nature, etc.) (4) Would you recommend this course and why? (5) How would you improve it? In responses where students noted deep changes in their identity a second probe was sent asking them if they could elaborate.

Table 6.1 Reflective types of transformation in consciousness

Types	Instrumental	Communicative	Prepective
Orientation	Pragmatic	Substantive	Critical
Beliefs	Stay the same or expand and enhance existing beliefs	Making sense of new ideas and experiences. Major changes that break with old ways into new directions. Reflections leading to coherence and reintegration of old and new beliefs	Reflexive questioning of own fundamental assumptions, values, and those people, events, experiences, etc. that contribute to their formation
Behaviours/ Actions	Continue in the same lifestyle habits. Gradual adoption of modified behaviors that are congruent with old	Adoption of different behaviors that incongruent with old beliefs and guided by a new set of beliefs. Voluntary stewardship	Shift in reasoning and meaning of routine behaviours. Undergoes lifestyle changes that substantially alter sense of being
Identity	Confirmation of existing self-identity	Acquire a new identity opening new social networks	Complete transformation in identity
Environmental sensibility	Already ecologically and/or environmentally aware	New discoveries and commitments to attaining new knowledge while engaging in environmental activities. Voluntary stewardship	Transformation into being ecologically sensitive, committed to voluntary stewardship of the earth and consciously reflects and makes an effort at lifestyle changes. Engaged environmentalism

Source The author

6.6 Findings

Three student narrative responses are presented below that represent the three types of Mezirow's reflective states presented earlier as part of the conceptual framework for this study. Each level characterizes differing states of consciousness: Type 1: Instrumental/pragmatic; Type 2: Communicative/substantive; and Type 3: Perspective/critical. In Table 6.1: the key features of these different states of conscious change and/or transformed are documented. The transformation of consciousness illustrated in each state denotes alterations in existing beliefs, behaviours and actions, conscious identity and environmental awareness.

The written narrative vignettes are presented below without any grammatical corrections for those students where English is a second language.

6.6.1 Instrumental/Pragmatic Transformation

Ron was the oldest student in the course, an adult in his 60's from Canada, returning to the university in the field of urban planning, from a career as a geologist. He was a newcomer to the field of education but already had an "intense interest in environmental and ecological issues" given his background profession. Two areas of change can be detected from Ron's responses: (1) learning style, (2) commitment to doing something in the field of environmental ecology.

> My involvement in this class has had a significant transforming impact on how I approach learning and daily living. I increased meditation and spiritual endeavours which is facilitating a more passionate approach to learning, as well as enhancing my ability to seek out and committing to emotional intelligent crusades (Ron, male student).

Ron's commitment to helping solve issues in the environment was refocused in his seeing the potential power of education.

> The course has shifted my focus from attempting to change the established unsustainable mindset (was involved in environmental policy development for a mining sector in Canada) to working towards developing an educational environment that will mass-produce an army of individuals of a sustainable mindset (Ron, male student).

Ron was strongly impacted in his learning style due to the transdisciplinary approach to classroom teaching. He thought that the content of the course was beneficial "due to the alternative perspectives introduced that are not found in mainstream education," in ways that "opens students up to alternate thought options and induces critical and multidisciplinary thinking empowering individuals to deepen their understanding of issues that matter to them." Presentation of multiple perspectives challenges students to broaden their interests, "raise and stimulate passion as part of the learning experience".

Ron already had a well-developed ecological mindset and interest in developing sustainable schools before attending the class. He found educational tools to help him become more effective and knowledgeable as a steward of the earth. He displays an instrumental/pragmatic state in that his existing beliefs about himself, the world, and his relationship with others is reaffirmed and strengthened. His learning experience was impacted in a way that motivated his further commitment to being an environmentalist.

> I attended this course due to my intense interest in environmental and ecological issues. The class supported my learning direction and deepened my commitment to continue in this line of study (Ron, male student).

The following summer, Ron travelled to Thailand to learn about the building of green schools there. He continued on as a Master's student with a focus in peace education and developing sustainable green schools.

6.6.2 Communicative/Substantive Transformation

Toshi was a high school English teacher from Japan who was on sabbatical and taking courses for his professional development. Toshi was very thoughtful in recounting his steps in the course and comprehending his own experience and its impact on his professional life.

> First of all, through this course I was convinced that environmental issue should be centered as the core in the school curriculum for the secondary schools in Japan… I came to understand that how to live wise and harmoniously with nature in a sustainable condition is the most important way of living for people all over the world (Toshi, male student).

Toshi acknowledged the value in "subject such as science and biology concerning nature … directly related with nature," and "educational TV programmes such as Discovery Channels or others can motivate kids to learn wonders of nature and harmonious balance of all living things. Therefore, we have to keep their motivation toward nature." He also learned that both developed and developing countries seek a wealthy economy, but "…it is a fact that they sacrificed nature for the compensation of the economic growth" with the "environmental condition on the globe deteriorating year by year". These revelations led Toshi to think further about the impact of technology and media on learning. Toshi more seriously became concerned about the impact of technology on children:

> … kids tend to rely on electronic devices too much in their daily life, such as cell phones, computer games, iPads,… So-called digital natives seem living in a virtual-reality world. I am wondering if these electronic devices can help kids' emotional growth compared with playing outside in nature; on the beaches or in the mountains, I feel that just chasing after 'efficiencies and conveniences' tend to deteriorate the natural growth of kids in the field of education (Toshi, male student).

Gradually, Toshi began to deeply reflect on the taken for granted social and cultural ways of educating in Japan. He sees the need to question the unquestioned acceptance of modern day technological advances and the current trend for schools to require ipads or to purchase them as a needed learning tool. The course opened his eyes to the destructive realities causing the environmental crisis and he questions their effectiveness in contrast to the service learning aspects of the course.

> At school, ordinary class is conducted in the classroom and students can know how serious the environmental situation is only through information via texts of media. However, students tend to be stuck in a dilemma, because the more they know how serious the situation is, the powerless they feel themselves for the solution. I know how important it is to make people bear eco consciousness in their mind. But trying to appeal the students with popular approach to environmental education, it often ends in vain. Only emphasis on facts about the symptoms of environmental destruction gave the students only a sense of powerlessness. The students feel that they can do nothing, for example, to stop global warming (Toshi, male student).

Toshi sees much more value in the service learning trips that were taken during the semester where he participated in the restoration of the waterways and crop

barren fields. He remembered the "fieldwork such as removing weeds along the waterway in the city of Honolulu" where the class had joined high school students to clean up the local watershed channel in their district. The instructor "took us to Kaua'i Island to join Hawaiian native tree planting activity …. It was a great experience for me to know that alien plants as well as insects and animals brought unconsciously by foreign tourists have invaded Hawaii and caused extinction of the native plants and animals."

> I had not known everything about Manoa Heritage [Center] until I went there. However, preserving the sacred agricultural site, Kuka 'O 'O Heiau taught me that original habitants of Hawaii basically relied on agriculture for their diet. Naturally, they thanked that they were blessed with the nature: affluent amount of rain, sunshine, and rich soil. They knew that this environment was not what human beings made, but these blessing was thanks to the geographical location and the volcanic region.
>
> Without visiting these places, I would not have realized how important nature is and how Hawaiian people depended on nature (Toshi, male student).

Toshi was "shocked to know that plastic garbage polluted beaches in the Pacific Ocean. Tremendous numbers of marine creatures are still suffering from plastic trash by swallowing them by mistake. Inside of the stomach of the dead sea-animals such as turtles and albatrosses are full of plastic garbage." Japanese tourism is the biggest sector of the economy for Hawaii. Toshi said he thought that because all Japanese tourists only stay in Waikiki that they think all of Hawaii's beaches are pristine. His experience participating in an environmental activity had a long-lasting impact.

> Thinking about the whole environmental issues I touched, they are too many and too heavy for me. Then I concluded that I should focus on just a few things that I can do. They are taking care of the forest and 'beach cleanup activity'. From the beginning I have been interested in caring forests in Japan. I thought that making more use of wood and bamboo could be one of the solutions to reduce plastic garbage in the sea. I mean that using daily goods, which are made of natural material, such as shopping bamboo basket or a cloth as much as possible can lead to reducing plastic bags at supermarkets (Toshi, male student).

When Toshi returned to Japan, he joined the student environmental projects that he had felt too busy to bother with before. He also began visiting recycling companies "to learn an effective way of reducing plastic garbage" and befriended an inventor of an oil converter machine that he wanted to send to Hawai'i. Toshi began accompanying his students to international environmental conferences sponsored by Toshiba to learn how other countries talk about and solve their environmental problems. He took an online course learning website technology and "create[d] a website in the Internet in order to inform as many children as possible about the polluted sea by plastic garbage". He was so moved that he "began to rethink what is important for human life" and saw his work as an educator for environmental awareness more fulfilling than his teaching English as a second language, what he had done all of his professional life.

> It is important for teachers to lead students or other ordinary people of the next generation to the right direction.

> My life as a schoolteacher has changed into more active one since then… I really appreciate this course. I would like to recommend this course to the students who want to spend their lives for the rest of the world as well as for themselves (Toshi, male student).

Toshi undergoes *substantial* change in his way of thinking about his professional commitments as a teacher and his new found purpose in life—environmental care and restoration. He has grown to appreciate nature and discovered a new way of relating to it. He coupled his thirst for knowledge with his identity as a global citizen reach beyond his national boundaries in correspondence with others through his website.

6.6.3 Perspective/Critical Transformation

Bae looks at his lifespan and the broader impact that the course had on his relationship with himself, others, the environment, and the global community as well as his professional identity, changes in his behaviours as an individual and professional teacher.

> This course has definitely helped me to awaken, to be conscientious, and to think critically of my milieu. The rigor of the reflective writings, online discussions and reading materials helped me to be able to think beyond the formal intellectual, abstract mode toward a wholesome way to genuinely care for the environment and ecology…raised my consciousness to be able to have planetary thoughts, beyond narrow ethnocentric mode of thinking (Bae, male student).

Bae reflects on his own framework of consciousness and how he has been socialized and conditioned to accept the culture of war consumer mentality as 'legitimate'.

> As an educator, it was empowering for me to experience firsthand the power of education in its ability to transform a person's dominant perspective. Making a shift form a myopic 'consumer' consciousness to ecological consciousness, I became more aware of the human potential to discover our relation to everything that is outside of us (Bae, male student).

He also sees the ethical and moral dimensions of his expanded consciousness and the necessity of putting knowledge into practice for some larger good.

> Moreover, I believe that my capacity for virtue grew as my consciousness evolve through this course. Coming to understand that most of our problems are a problem of consciousness, I learned that its not important how intelligent or knowledgeable a person is, but it is critical how our consciousness is used to employ intelligence or knowledge either for good or evil ends (Bae, male student).

Including an ethical dimension in his teaching to raise middle school students' awareness about environmental issues necessitated a change in his instructional methods.

> As an educator I am employing more integral pedagogy as my evolved consciousness necessitates me to make a paradigm shift in how I relate to students, and how they learn. (Bae, male student)

Mezirow talks about reification as forms of socio-cultural distortion that "pertain to power and social relationships, especially those current prevailing and legitimized and enforced by institutions. A common sociocultural distortion is mistaking self-fulfilling and self-validating beliefs for beliefs that are not self-fulfilling and self-validating" (Mezirow 1991: 15). Sartre (1985) talks about this phenomenon as an "internalization of the external" in acting within the "practico-inert" of established institutions. Here, Bae reflects on his own reification of the 'prescribed role' of the teacher supported by his educational institution and how he has become more of a feeling, loving, thinking person in the process.

> I can say that my behaviour before in relating to my students and animals was 'disconnected', aloof, and even indifferent. I was preoccupied with trying to fulfill externally prescribed role as a teacher and felt disconnected from my real self with the role (Bae, male student).

Bae has become more engaged in determining the meaningfulness of his curriculum set for his students. This transformation in consciousness also changed his way of relating to his students. He is willing to challenge the status quo in ways he did not imagine before with a new conviction derived from his experiential learning.

> I am asking larger questions in social studies classes to engage students with broader views of the world. In organizing curriculum, I try to reflect the important and exigent issues of human and environmental survival. This approach gives me courage to challenge and reject administrators' and parents' pressure to perpetuate narrow vision of outdated pedagogical assumptions (Bae, male student).

Furthermore, Bae sees his own continued growth as a *whole* person reflected in his professional growth as a teacher.

> As an educator, acquiring ecological consciousness made me rethink the purposes of learning. My intellectual emphasis, loyalties, and convictions have changed. What I try to accomplish has essentially become community practice than mere ideology. As I feel more integrated as a person, I am able to relate to my students better. It has made me more authentic and with more capacity to love, I found new meaning in being a teacher (Bae, male student).

Bae's personal lifestyle habits have also changed.

> My eating habits have changed to become more or less vegetarian unless I can find organic meat and poultry, and I shop for non-GMO produces from local markets whenever or wherever I can. I shop for eco-friendly household items, being mindful of their impact on the environment while in use and after they are discarded. I recycle almost everything. I am eager to learn about garden to become self-sufficient. I engage in a number of community parks and beach cleanups. My relationship with animals has improved and I appreciate our dog as a helpful living companion than as a mere pet (Bae, male student).

Bae delves even deeper into his childhood to look for answers, what was transformed and what he'd like to become more fully as a human being.

> I left South Korea when I was 15, in 1979. It was a period when the country was undergoing massive industrial production and rapid modernization. Air pollution was a

> serious problem as it is in Chinese cities today and it seemed as if any natural resources available were exploited in the name of national "survival." I think I just grew up thinking that nature was to be tamed and used for the benefit of human comfort. Being a burgeoning third world country, "survival of the fittest" and competitive mindset was inculcated from elementary school. In the everyday language, the word "kill" was widely used, as in "kill the communists," "I'll kill you in competition," "I'll succeed even if I have to kill myself" etc.
>
> Although I grew up in a loving family, I remember taking pleasure in killing insects in sadistic manner-injecting caterpillars with pesticide using a syringe, putting spiders on a hot charcoal to watch them burn, stepping on hundreds of ants, burning up ants with a homemade flame thrower (holding a lighter and spraying it with flammable mosquito spray can-crazy!!!), throwing bricks on a snake, etc. I remember growing up with little empathy for other living beings, never mind other human beings in less fortunate situation. In village markets, animal parts hung in the butcher shops for sale-heads, legs, intestines, etc.—and I guess I thought animals existed for human consumption. We did raise many dogs at home, a dozen a time, but they lived outside even in below freezing harsh winters. It never occurred to me that dogs could live inside the house with humans. They were lesser beings.
>
> There simply was no environmental awareness education and I grew up as a 'consumer' with little regard for the consequences of my consumer activity. Basically, I was out of touch with myself and my relation to the environment.
>
> I think I began to develop some environmental awareness when I read Buddhist philosophies after graduating from college but the definite shift took place after taking your environmental education course in my 40 s. In that regard, I'm a believer that environmental education CAN change a person's perspective.
>
> I have so much regrets for having been such an insensitive and cruel person for the animals and sorry for the environment for all the waste that I contributed… Just imagining that there could be billions of people like me is a scary prospect (Bae, male student).

Bae reflects on the social-cultural influences throughout his childhood and youth that, as all youth, are those unconscious forces beyond their comprehension. Teachers are in an exceptional position to open the perspectives and provide experiences that go beyond family in educating about environmental issues. Bae demonstrated a full-blown *perspective transformation* in all aspects of his identity with himself, others, the environment, and the global planet.

6.6.4 Summary Analysis

As a preliminary pilot to further research about how to transform students' consciousness in becoming stewards of the earth through education, this chapter looks at a peace environmental course design, content, pedagogy, and assignments that garnered these kinds of changes. As we can see from the three case studies above when combining the principles of peace and environmental education guiding the course curriculum, design, assignments and activities, there can be transformative affects on student consciousness that follow into professional careers. Bae now loves teaching his middle school students and relates to them as members of his *ohana* (extended family). Last year he told me that he was so moved that he cried at his students' graduation ceremony which he could never

have imagined before. Jennifer now is one of the teacher leaders at her high school and has integrated environmental activities and sustainability practices in her art classes. Carey works as an education specialist for a local non-profit group that manages after-school programmes and helps schools develop gardens.

6.7 Conclusions and Further Research

This chapter set out to respond to the call for ways that enable sustainable transformation and sustainable peace by promoting an educational project involving a course in environmental peace education tied to the broader vision of creating peace gardens in schools. I have presented a pilot that presents preliminary results in teaching an environmental education course from a peace perspective and its transformational impact on students in a post-graduation follow-up. In doing so, I have raised many more questions than I may have simply answered. As a small step, in the hope of raising interest in a research programme that looks at the transformation of human consciousness towards peace ecological mindfulness, what are some of the educational components needed? We know that at the very least, the following course components are critical to include: (1) outdoor experiences that expose students to the material reality of environmental problems along with their participation in restoration activities; (2) experiences that reveal another culture's way of relating to nature and living sustainably within its environmental resources; (3) a transdisciplinary perspective that includes the presentation of multiple disciplinary critical perspectives in content, approaches to investigating the problem, collaborative resolutions to problem-solving and problem-posing; (4) openness to all learning pedagogies appropriate to the conditions of learning, contexts and capability of learners and content goals; (5) assignments that reflect respect and empower learners to take responsibility for their learning outcomes in a way that combines student personal/professional interests with service to others and the global community. (6) The guidance of peace and ecological values and principles of equality, mutual respect, social justice, solidarity, trust, non-discrimination, openness, flexibility, and empowerment in class discussion, course assignments, design, instructional pedagogy and outcomes.

Further research also needs to be developed about the nature of change and transformative processes in human consciousness, reflective processes of perspective taking and their translation into action in combined peace and environmental studies. Clearly, as an emergent state, consciousness about the intentional background or network of beliefs cannot be adequately researched in the traditional approaches to human cognition whereby knowledge and experience are categorized as individuated, unstructured, and isolated units or bits of information. Reflections that lead to self-understanding and transformation of consciousness are best conducted with the use of narrative inquiry, hermeneutic, phenomenological, critical and intentional studies in the investigation of meaning making cognitive organizing processes. If there are different degrees of criticality and change, what

are the delimitations of these wholistic boundaries? If reflection is a retrospective process, how does memory relate what is valued in the past and operate in interpreting present experiences or anticipate future events? Does memory get in the way of a sustainable peace when the cultural (and dialogical) context is bathed in association with the politics of war and social-institutional-cultural acts of violence?

Hopefully this chapter presents new ideas for educators who are interested in transforming schools and seeing them as effective institutions of change for creating ecologically peace minded people who work towards a more peaceful and sustainable world in all that they do because they know what it's like.

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Chapter 7
Building Peace by Rebuilding Community Through Women in Japan

Kazuyo Yamane

Abstract Japan ranked 101th out of 135 countries in the Gender Gap Index in 2012 and the participation of Japanese women in politics and economy is low. It is necessary to change the working conditions of both men and women and to educate young people and children about gender equality and on building peace at school and communities through media and peace museums. Although the political and economic position of Japanese women is low, they have contributed to rebuilding community at the grassroots level to build peace. Several women's organizations try to improve the life of women and children and build peace such as the Japan Federation of Women's Organizations, the New Japan Women's Association and Mothers' organizations. These women have worked hard on nuclear weapons, nuclear energy, human rights, the environment and sustainable development in cooperation with women in other countries. The successful opposition against the construction of nuclear power plants in Kochi shows that it is important to educate citizens, especially women, and that they can make a great change for building peace by rebuilding the community.

Keywords Atomic bomb · Community · Japan · Nuclear energy · Peace · Pollution · Women

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7.1 Introduction

Japan suffered from the atomic bombing on Hiroshima on August 6 and also on Nagasaki on August 9, 1945. Japanese fishermen also suffered from radiation caused by the U.S. hydrogen bomb test in 1954 on Bikini Atoll in the Marshall Islands. On March 11, 2011 people have sufferred from a magnitude 9.0 earthquake, a huge tsunami and a disaster in the Fukushima Nuclear Power Plant. This means that Japanese people were exposed to radiation at least four times in history and they have been suffering from various radiation effects. "Community resilience, or the sustained ability of a community to withstand and recover from adversity (e.g., economic stress, influenza pandemic, man-made or natural disasters) has become a key policy issue, which is being embraced at federal, state, and local levels" (Rand 2011: 3) How have Japanese people been trying to deal with such problems as radiation and build peace? It seems that Japanese women have been making great efforts to build peace by rebuilding community that had been destroyed by various adversities since 1954.

What is the position of Japanese women in the world? According to the Global Gender Gap Index, national gender gaps on economic, political, education and health-based criteria are ranked which allows effective comparisons across regions and income groups, and over time.[1] Japan ranks 101th out of 135 countries in the Gender Gap Index in 2012.[2] Only 11 % of parliamentary seats and 12 % of ministerial positions are held by women. Japan's political empowerment rank is 110 out of 135 countries. In comparison the Chinese political empowerment rank is 58 while Korea ranks 86. Thus, in Asia, Japan's political empowerment rank is quite low.

Regarding economic participation and opportunity, Japanese women rank 102. The female to male ratio in the labour force is 0.73 on a 0.00–1.00 scale (0 = inequality score, 1 = equality score) and in wage equality 0.64. Female to male ratio for legislators, senior officials and managers is only 0.1.

But the life expectancy of Japanese women was the highest in the world according to the gender gap index. It was 86 years in July 2009. After the combined disaster in March 2011 the life expectancy of Japanese women dropped from 86.3 years in 2010 to 85.9.[3] Their literacy rank is number one as their enrollment in primary and secondary education, but in tertiary education they ranked 100 of 135 countries.

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[1] 'The Global Gender Gap Report 2012'; at: http://www.weforum.org/reports/global-gender-gap-report-2012 (1 November 2012).

[2] "The Global Gender Gap Report 2012"; at: http://www3.weforum.org/docs/WEF_GenderGap_Report_2012.pdf (1 November 2012).

[3] : "Japan falls down female life expectancy rankings after tsunami", in: *The Guardian Datablog*, at: http://www.guardian.co.uk/news/datablog/2012/jul/26/life-expectancy-japan-falls-fukushima-tsunami (2 November 2012).

Japanese women's high rank in education and welfare may be linked to Article 9 of the Japanese Constitution that renounces war and the existence of the military. Nevertheless Japan's Self Defence Forces exist and consume less than 1 % of Japan's GDP (World Bank 2012).[4]

Why is Japanese female participation in politics so low? First, it is not easy for women to have a job and do housework simultaneously because many men are forced to work for long hours and have little time for taking care of children. Many men believe that women should care for the house and children. Women are not well educated to run in an election and become future policy makers. In education and in the media heroes and leaders are often men and it is hard for women to identify women leaders, pioneers and peace makers. There is no quota system for political parties in Japan, although there are 10.9 %. women politicians in the House of Representatives, 12.7 % in the Democratic Party of Japan, 6.9 % in the Liberal Democratic Party, 16.7 % in the Social Democratic Party, 14.2 % in the Komei Party, and 11.1 % in the Japan Communist Party[5] as of February 2012.[6] In the election of the House of Representatives in December 2012 only 38 women were elected, 16 less than in 2009: 23 in the LDP, 5 in Japan Restoration Party, 3 in DPJ, 3 in Komei Party, 3 in Japan Future Party and 1 in JCP. The percentage of women was only 8 %.

Quota systems aim to achieve representation of women at 20, 30 or 40 %, or even a true gender balance of 50 %.[7] Such quotas are needed in Japan. Due to high campaign costs it is not easy for women to run in an election unless they belong to a political party.

7.2 Present Situation of Japanese Women

The rate of working women is 62 % which ranks 78th out of 135 countries according to the Gender Gap Index 2012. The reason why the rate of working women is lower than men is that there aren't enough nursery schools for them. There is also sexual discrimination against women: it is not easy for women to

[4] World Bank, 2012: *World Development Indicators*; at: http://data.worldbank.org/indicator/MS.MIL.XPND.GD.ZS (28 June 2013).

[5] Mitsui, Mariko, 2009: "The number of women winners of the general election of the House of Representatives is the highest in history, but the female rate is the lowest in the world", in: *Japan Alternative News for Justices and New Cultures* (in Japanese), 2 September; at: http://www.news.janjan.jp/government/0909/0909019596/1.php (2 November 2012).

[6] "Association for Increasing Women Politician: Women and Election"; at: http://www.geocities.jp/senkyo_power/data/num_01_shu.html (1 November 2012).

[7] "Global Database of Quotas for Women", A joint project of IDEA (International Institute for Democracy and Electoral Assistance) and Stockholm University; at: http://www.quotaproject.org/aboutQuotas.cfm (2 November 2012).

continue to work after they give birth to a baby. Furthermore, women tend to think that they should stay home once they give birth to a baby and take care of children.

How many hours do Japanese women spend in doing house chores? The longest time in Japan is 5 h 33 min in Kanagawa Prefecture while the shortest one is 4.2 h in Kochi Prefecture according to *Owarai Gender-ron* (Humorous Book on Gender) by Sechiyama (2001: 23). The reason is that more women tend to work in Kochi than those in other prefectures because there is no big industry so men's average wages are relatively low and women have to work to make ends meet. There is also historical background that Kochi is the birthplace of the movement for freedom and human rights in Japan. Kusunose Kita (1836–1920) is the first woman who demanded women's suffrage in Japan and realized it in Kamimachi town in Kochi in 1880. This is relatively early internationally because it was 1893 when woman suffrage was realized in New Zealand though this is at the national level. Kita Kusunose was influenced by the democratic movement in Kochi. After her husband passed away, she tried to vote, but it was rejected because she was told that a woman did not have a right of vote. However, she demanded she have a right of vote because she paid tax. She wrote a letter to the prefectural office asking if there should be any discrimination against women in terms of human rights. She won and women's suffrage was realized in Kochi in 1880.

Women in Kochi seem to be very independent and work hard, which may be because of such long tradition of the movement for democracy. Kochi is said to be "the Kingdom of Nursery School" because there are many nursery schools. This is because women have been working hard and they needed them in order to keep working after they give birth to a baby. There was a mothers' movement to create as many nursery schools as mail-posts in Kochi. However, it is unfortunate that the rate of divorce is pretty high in Kochi in comparison with other prefectures: Kochi ranks 3rd among 47 prefectures in Japan in the rate of divorce that is 43 % while Aomori ranks 1st (45 %) according to the statistics of the Ministry of Health, Labour and Welfare as of June 25, 2012.[8] However, the rate of divorce in Japan is 33.1 % in 2012 and Japan ranks 14th in the world and 1st in Asia.[9] Belgium ranks 1st (59.8 %) followed by Sweden (53.9 %) and Czech Republic (53.7 %).

It is not easy for full-time female workers to work, do house chores and take care of their children while their husbands work until late at night. As for part-time female workers, they suffer from the lack of income to make ends meet because the budget for welfare was reduced by 220 billion yen every year from 2001 to 2007. This means the increase of the cost for medicine and nursing care, and women, especially single mothers, has made it hard to live. For example, a mother of three children aged 30 was fired by Canon Company against a contract and her children were taken care of at Children's House for 24 h. She had been looking for a job, but it was hard for her to get one. This story was told by her at Mothers'

[8] *Honkawa Data Tribune*; at: http://www2.ttcn.ne.jp/honkawa/7342.html (2 November 2012).

[9] "NationMaster.com"; at: http://www.nationmaster.com/graph/peo_div_per_100_mar-people-divorces-per-100-marriages (23 June 2013).

Congress held on July 25 and 26, 2009 in Kyoto and shared with other participants. Some of them snivelled listening to her story that she would like to live with her children and get a job.

As this example shows, Japanese women have faced various problems and cannot live peacefully. However, "ordinary and previously oppressed people should have a voice and can make history" and "citizens and community participation, which gives 'voice' to people previously silent in public discourse, is needed to improve decision making, address a wide range of problems, and democratize society" as Fisher (1997: 62) pointed out. Then what have Japanese women done to solve such problems as oppressed people in the male-oriented society for a long time?

7.3 Efforts to Change Reality by Women at a Grassroots Level

Since Japanese women have been oppressed and know the preciousness of life and peace, they began to work for peace at the grassroots level. "It is often from non-state actors, such as *non-governmental organizations* (NGOs), that alternative approaches are championed" (Collins 2013: 4). The low status of Japanese women made it impossible for them to work as decision makers and they had to work for peace at a grassroots level for peace. There are various women's NGOs in Japan and a few of them will be introduced to show how they have been building peace by rebuilding community that had been destroyed by atomic bombs, nuclear accidents, pollution and so forth in Japan.

7.3.1 The Japan Federation of Women's Organizations

The Japan Federation of Women's Organizations (Nihon Fujin Dantai Rengokai) was founded on April 5, 1953 during the Korean War. The purpose is to unite women all over Japan for promoting peace. When Japanese fishermen were exposed to radiation by the US hydrogen bomb test on Bikini Atoll in the Marshall Islands in 1954 and died, Japanese women made an appeal against atomic and hydrogen bomb tests to the Women's International Democratic Federation which was founded in Paris in 1945. This led to opening the World Mothers Congress in 1956 in Switzerland. The US and Japanese politicians have been trying to change Article 9 of the Japanese Constitution that renounces war and the possession of military. However, women in the Japan Federation of Women's Organizations have been protesting against war by conducting peace marches, making an issue-advocacy advertisement in the newspaper and so forth in order to protest the Security Treaty between Japan and the United States concluded in 1951 and

abolish nuclear weapons as well as nuclear power plants. United actions were organized to solve various issues hoping for peace, democracy, gender equality, happiness for children and the improvement of education and welfare.

There are about 20 organizations which belong to the federation such as the New Japan Women's Association, Women Section of the National Labour Union Federation, Free Lawyers Organization, the National Teachers and Staff Union and others. The federation has been active not only nationally but also internationally. It became a member of Women's International Democratic Federation in 1957 and contributed to the development of the federation. In the 1970s the Japan federation collected 100 million yen of donation to build a health centre for mothers and children in Vietnam cooperating with women in the world. In 1991 they made an appeal against the Gulf War with 30 other organizations. In 2003 a peace rally against the war in Iraq was organized and women had a peace march in Tokyo and other places. Now they have been protesting against the deployment of the MV-22 Osprey, the trouble-plagued tilt-rotor aircraft at the US military base in Okinawa because they had accidents in Morocco and Florida. "Though officials blame pilot error for the accidents, that has hardly eased local fears in densely crowded Okinawa, which has seen hundreds of crashes and emergency landings of military jets and helicopters since the 1950s, several of them fatal" according to the New York Times dated September 14, 2012.[10] Japanese women have been promoting solidarity with women in the world to improve Japanese women's social position and solve various issues.[11]

7.3.2 The New Japan Women's Association

One of the organizations that belong to the Japan Federation of Women's Organizations is the New Japan Women's Association. It was founded in 1962 and joins hands with women in the world for building peace. It has chapters in all the 47 prefectures and branches in 880 municipalities according to its website.[12]

The New Japan Women's Association (NJWA or Shinfujin) was founded on October 19, 1962 at the call of 32 women including Raicho Hiratsuka (a pioneer of the Japanese women's movement and the first president of the Japan Federation of Women's Organizations), Yaeko Nogami (a writer) and Chihiro Iwasaki (an artist of paintings for children.) Their activities are carried out in over 10,000 groups, which are organized all over the country; in workplaces and communities, including rural areas. The association has a head office that unites chapters

[10] "Ospreys in Okinawa", in: *The New York Times* (14 September 2012); at: http://www.nytimes.com/2012/09/15/opinion/ospreys-in-okinawa.html?_r=0 (3 November 2012).

[11] Japan Federation of Women's Organizations (Nihon Fujin Dantai Rengokai),Address: 4-11-9-303 Sndagaya, Shibuya-ku, Tokyo, Japan 151-0051; at: http://www16.ocn.ne.jp/～fudanren/; email: fudanren@cocoa.ocn.ne.jp.

[12] Shinfujin, Address: 5-10-20, Koishikawa, Bunkyo-ku, Tokyo 112-0002; at: http://www.shinfujin.gr.jp/eng/1_what/index.html.

working in all the 47 prefectures and branches in 880 municipalities. Under the five objectives, members of the association work to realize all kinds of women's demands concerning such issues as women's rights, equality with men, better working and living conditions, measures to support child-care, education, environmental protection, peace and abolition of nuclear weapons.

The five objectives are:

1. Protect the lives of women and children from the danger of nuclear war.
2. Oppose the adverse revision of the Constitution and the resurgence of militarism.
3. Work together for better living conditions, women's rights and children's well-being.
4. Win genuine national independence, democracy and emancipation of women.
5. Join hands with women in the world for building lasting peace.

The association is opened to all women who agree with the above five objectives, irrespective of their thought, creed or political background. It publishes a weekly newspaper called "Shinfujin Shinbun" with 300,000 readers, and a monthly magazine "Josei & Undo" ("Women & Movement"). It is a member of the Japan Federation of Women's Organizations (Fudanren) as mentioned above and the International Women's Year Liaison Group (comprising 40 major Japanese women's organizations.) In May 2003, the association was granted Special Consultative Status by the U.N. Economic and Social Council. The association held an event to celebrate its fiftieth anniversary in Tokyo on October 19, 2012. About 1,700 delegates from all over the country attended the event. They have been active for peace especially in protecting Article 9 of the Japanese Constitution that renounces war, for the abolition of nuclear weapons, nuclear power plants and the US military bases in Japan.

Peace rallies have been held in various parts of Japan every March 8, the International Women's Day. Women protested against US soldier's rape of a woman in Okinawa sending letters calling for the abolition of the Japan–US Security Treaty to President Obama and Prime Minister Noda on October 18, 2012. A rally against the deployment of the MV-22 Osprey was organized in Tokyo and they organized a peace March to the National Diet on October 23, 2012. Over 2,000 women attended it though it was raining. The same rallies were held in 39 prefectures in Japan, but such grassroots activities for peace have not been reported in the media. As a result, their activities for peace have not been well known among politicians and ordinary people. However, they are highly regarded internationally, especially among peace activists abroad because there have been international exchanges of various events and ideas.

7.3.3 Mothers' Movement for Peace

There is also mothers' movement for promoting peace at the grassroots level. The first Mothers' Congress was held in June 1955 in the course of the development of

the movement against Atomic and Hydrogen bombs that followed the tragedy at Bikini Atoll in which many Japanese tuna fishing boats were showered with fallout from a U.S. hydrogen bomb test explosion on March 1, 1954. Japanese mothers expressed their strong desire to protect children against nuclear war in the first Mothers' Congress. The annual Japan Mothers' Congress, which has represented Japanese mothers' wishes for peace, has been held at various places in Japan. The latest Mothers Congress was held in Niigata Prefecture and a total of 13,200 mothers participated in it according to Mothers Newspaper (Hahaoya Shinbun) dated September 15, 2012. What is a brief history of mothers' movement in Japan?

Fourteen mothers were sent to the World Mothers Congress held in 1956 in Switzerland. They learned the importance of solidarity with other mothers internationally. In 1959 since Japanese peace activities were attacked by rulers and McCarthyism (anti-communists campaign), a mother said, "If it is 'red' to work for peace, let us all mothers in Japan become 'red'!" at the Mothers Congress. Then mothers started a peace march for the first time in history. In 1960 they protested against the Japan–US Security Treaty because they were against dangerous US military bases. In 1966 they had rallies and peace marches to help Vietnamese mothers and children during the Vietnam War. In 1970 the 16th Mothers Congress was held in Tokyo and Kanagawa and a total of 22,000 mothers attended it. An emphasis was put on protesting against the environmental pollution such as air pollution.

For example, mothers in Tokyo used empty cans of milk powder in order to measure toxic gas in the air in November 1969.[13] Sulphurous acid gas was released about 20 years and people in Tokyo got sick and suffered much. Mothers in Ota Ward in Tokyo contacted medical doctors in Ota Hospital and decided to measure the amount of sulphurous acid gas in the air using empty cans of milk powder. A filter paper saturated in potassium carbonate was hung in the air and if there is sulphurous acid in the air, alkali salt was produced, which made it possible to measure the amount of sulphurous acid gas. An empty can of milk powder was used so that a filter paper would not be exposed to rain. Twenty small holes were made in the empty can for ventilation. The filter paper was hung using a clothespeg at various houses. Any mother could cooperate with the investigation and the movement was spread quickly. This is because children suffered from asthma and chronic bronchitis. An analysis of the result of the investigation was done by doctors at Ota Hospital. The movement spread at other wards in Tokyo and the Association to Eliminate Pollution was made on July 24, 1970. An appeal to make the association to the public was made by 28 professors, medical doctors, lawyers, and heads of neighbourhood association, as well as 21 organizations such as labour unions. On July 26, 1970 about 150 people had a rally against pollution at Shimura Junior High School and negotiated with five representatives of Shimura Chemical Factory which released sulphurous acid gas in the air and five representatives of

[13] "Wishing the elimination of pollution (Kougai Tsuihouno Negaikomete)", in: *The Akahata* (26 July 1970): 5.

Tokyo Municipal Government.[14] The participants demanded that the chemical company stop the pollution as soon as possible, and the Tokyo Municipal Government regulate the pollution severely. A housewife said, "We have been deceived by the company over 20 years, but we cannot put up with the air pollution anymore. We need compensation from the chemical company."[15] The company was forced to be closed in 1979 because of the grassroots movement against the air pollution.[16] Thus women in Tokyo contributed to rebuilding the communities which had been contaminated with air pollution. Such action is not just what happened in the past in Japan, but it is relevant to the polluted communities in China. Japan has been affected by Chinese pollution and people tend to wear masks to protect themselves and Japanese children cannot play outside when there is some influence by the air pollution from China.

Other reported issues at the Mothers Congress in 1970 were diseases caused by cooking oil contaminated with PCB in Fukuoka Prefecture, diseases by the environmental disruption caused by mining in Toyama, Minamata disease caused by mercury in factory waste in Niigata, slimy pollution in Tagonoura port caused by a paper manufacturing company in Shizuoka, air pollution in Amagasaki, Hyogo, photochemical pollution in Tokyo and so forth (Editorial Committee of The 50-Year History of Japan Mothers Congress 2009: 85).[17] As for Minamata disease, it was caused by an organic mercury compound from Chisso Corporation in Minamata City in Kumamoto Prefecture in Kyushu in 1953 and also in Nigata Prefecture in 1960. People suffered from mercury poisoning such as numbness, a speech disorder, motor disturbance, nerve damage and so forth after eating fish and shellfish contaminated with mercury. People filed lawsuits, but it was not easy to win in a legal suit. However, there is a positive case: it was ruled at the Supreme Court on October 15, 2004 that the Japanese government and Kumamoto Prefectural government had its administrative responsibility for regulating draining from the chemical company. It was also ruled that the company should compensate 37 victims of the pollution with 71.5 million yen.[18]

Referring to such Minamata disease, the Minamata Convention was made at the UN conference held in Geneva in January 2013 in order to reduce the influence of mercury on human beings and the environment. It was named after the Japanese town called Minamata that experienced one of the world's worst cases of mercury poisoning. More than 140 countries agreed on a set of legally binding measures to curb mercury pollution. The Minamata Convention is very important because

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[14] "We cannot postpone the solution of the pollution any more" (Mo Yuyodekinu), in: *The Akahata* (28 July 1970).

[15] Ibid.

[16] S Science Company: "An Outline of S Science Company"; at: http://www.s-science.jp/_co.html (20 Febrary 2013).

[17] Japan Mothers Congress, 2009: *The 50-Year History of Japan Mothers Congress (1955–2004)* (Nihon Hahaoya Taikai 50 nenno Ayumi) (Tokyo: Japan Mothers Congress Liaison Council).

[18] "Double Standard in the Recognition of Minamata Disease", in: *The Asahi Shinbun* (27 October 2004).

"The UN recently published data that showed mercury emissions were rising in a number of developing nations".[19] Under such circumstances Japan's grappling with pollution at grassroots level may be a good example to solve the issue of pollution.

Mothers have been also active in anti-nuclear movement for peace in the 1970s and 1980s. For example, when the first special session on disarmament of the U.N. General Assembly took place in New York in 1978, 500 Japanese handed 18 million signatures against nuclear weapons to the then U.N. Secretary-General Kurt Waldheim.[20] Many women including mothers contributed to collecting signatures and informing people of the danger of nuclear weapons. When mothers tried to send seven delegates to the second special session on disarmament with 30 million signatures against nuclear weapons, the United States rejected issuing some of their visas and the mothers had to change their plan and went to anti-nuclear rallies held in Europe.[21]

Mothers played important roles to make many cities declare nuclear free in the 1980s. It was decided to call for the national campaign to ask local governments to declare themselves nuclear free at Mothers Congress in 1982. As a result, about 80 % of Japanese cities declared themselves nuclear free. It was Manchester that declared itself nuclear free for the first time in the world in 1980. Such anti-nuclear movement spread in the world and about 1,500 local governments declared themselves nuclear free in Japan today according to the National Council of Japan Nuclear Free Local Authorities.[22] After local governments' declaration, mothers called for concrete ways to make their cities nuclear free and suggested that peace museums be created in order to promote peace education not only at schools but also in communities. As a result, many public peace museums were founded in Japan in the 1990s. Actually the number of Japanese peace museums is the highest in the world (52 %) and 48 % of Japanese peace museums were created in the 1990s (Yamane 2006: 66).[23]

The 55th Conference of Mothers' Congress was held in Kyoto on July 25 and 26, 2009 and a total of 17,500 people participated in it.[24] There have been various issues such as disparity in income, degrading welfare and environmental problems. Mothers got together to change such a situation so that people would be able to live in peace and harmony. They exchanged ideas and experiences to improve their life. For example, an illustrator said, "I am paid only 358 yen an hour and my pride

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[19] "Nations agree on legally binding mercury rules"; at: http://www.bbc.co.uk/news/science-environment-21078176 (21 February 2013).

[20] Ibid., 102.

[21] Ibid., 113.

[22] The National Council of Japan Nuclear Free Local Authorities; at: http://www.nucfreejapan.com/index.htm (19 February 2013).

[23] Yamane, Kazuyo, 2006: *Grassroots Museums for Peace in Japan* (Saarbrücken: VDM).

[24] "The 55th Mothers Congress Held", in: *Zenkoku Shoukou Shinbun* (National Commerce Newspaper), 10 August 2009; at: http://www.zenshoren.or.jp/shoukai/fujin/090810-08/090810.html.

is trampled. I hope that such a system will be abolished as soon as possible and women will be able to live more humanly." (The average minimum wage was 717 yen in Kyoto in 2009.[25]) Many workers are forced to work for long hours every day. Mrs. Hiroko Uchino lost her husband who used to work for Toyota Motor Company because he worked over 144 h after his regular work per month.[26] This means that he worked about 13 h a day including weekends. He is not exceptional: so many workers are forced to work after their regular work for free and they do not have much time to sleep. She filed a lawsuit and won the case after 6 years. Japan tends to be regarded as a rich country, but many workers and women are not rich at all. However, it is encouraging that women are not quiet anymore and speak out more than before to improve their lives.

Mothers' Congress is also held locally in various parts of Japan and peace issues have been discussed between representatives of mothers and local government as well as Japanese government. There is such a slogan as "Let's get rid of lonely mothers" so that mothers become friends to solve various issues and problems surrounding children. This is because the number of nuclear family has been increasing and mothers tend to be isolated without their parents' support. In 1974 Ms. Hideo Maruoka, a critic, gave a lecture called "If mothers change, the society can be changed" at the 20th Mothers Congress. Mothers have been working hard to protect their children for peace and improve their lives so that they will be able to live peacefully.

7.3.4 A Successful Case of Women's Movement Against Constructing Nuclear Power Plants in Kochi

The Japanese government and local governments supported the construction of nuclear power plants in various places in Japan and 54 nuclear power plants were constructed. However, only one nuclear power plant in Oi, Fukui Prefecture is working as of February 2013 after 3.11 earthquake and nuclear accidents in Fukushima in 2011. It should be noted that mothers and women played important roles in making it impossible to construct a nuclear power plant in Kubokawa-town in Kochi Prefecture in the 1980s. It was reported that nuclear power plants might be constructed in the town in June, 1980 and the Association for Hometown was organized to protest against making nuclear power plants in the town in December, 1980. Signatures were collected to demand the resignation of the town mayor. Women including mothers were busy making standing signboards and

[25] "We cannot live at the lowest wage", in: *Yomiuri Online Newspaper*, 29 May 2009; at: http://www.yomiuri.co.jp/national/yuragu/yuragu090629.htm (15 Feb. 2013).

[26] "The 54th Mothers Congress: Peace, Environment & Poverty: Women Paving the Way to the Future based on the Constitution", in: *Shinfujin*, 7 August 2008; at: http://www.shinfujin.gr.jp/a_1_shinbun/kiji08/2008_08_7_hahaoyataikai.html (15 February 2013).

giving a public speech from a car though it was the first time for them to do such activities. Their children cooperated with their mothers when mothers had a meeting by cooking dinner, for example. Secretary-General Yoshio Sakurauchi of the Liberal Democratic Party (LDP), the then ruling party, and Mr. Ichiro Nakagawa, the then head of the Science and Technology Agency, went to Kochi and gave anti-nuclear activists great pressure. Some violent LDP members and gangsters surrounded some mothers who were giving a speech by a stick and a knife saying, "I'll kill you!" However, mothers were undaunted. A male car driver for the mothers said, "I thought that women were gentle and quiet only, but I was surprised to know that they were so strong. I could not escape from gangsters as a man" (The Editorial Board of Making 50 Year-History of Kochi Mothers' Movement 2004: 55).[27] He started to put on a helmet when he was driving a car for the mothers who gave a public speech in a car. Mothers studied the danger of nuclear energy very hard and were convinced that they should stop the construction of nuclear power stations for their children. This is because there was no technology of dealing with nuclear waste which is radioactive and dangerous. Though they were not trained to give a speech publicly, they began to be courageous to criticize the mayor. When he was giving his speech for nuclear energy, a mother said to him, "Please let me use your microphone a little bit" and she began to say, "What the mayor said is a lie. The truth is …"[28]

It was decided that the town mayor should resign after the result of voting for his resignation on March 8, 1981. This was the first local referendum on questioning the construction of nuclear power plants in Japan. It was called "a big victory of a small town" and it gained attention internationally, but not nationally. This is because it was not reported nationally in the media which tends to support nuclear energy. Although Kochi municipal government tried to construct them, Kochi Mothers' Liaison Council negotiated with Kochi governor and Shikoku Electric Company and put a huge advertisement against constructing nuclear power plants in Kochi Newspaper on June 2 and 5: 8,605 people donated money to make an appeal and it was published. As a result, it was decided not to construct nuclear power plants in Kubokawa town at the assembly on June 25, 1988. The people of the town were divided into two after this nuclear issue was introduced, but it was ended after 8 years by women's great efforts for peace. Mrs. Tomiko Tanaka of Kubokawa Mothers Liaison Council said, "We learned that one person's power is weak, but if we are united, we can be powerful. We also learned that we should not be apathetic regarding politics and we should have our own opinions".[29]

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[27] The Editorial Board of Making 50 Year-history of Kochi Mothers' Movement (Kochi-ken Hahaoya Undou 50 nenshi Henshu Iinkai), 2004: *The History of Mothers' Movement in Kochi* (Kochi-kenno Hahaoya Undou 50 nenshi) (Kochi: Kochi Mothers' Movement Liaison Council).

[28] Ibid.: 61.

[29] Ibid., 56.

The successful case of preventing the construction of nuclear power plants can be useful in areas where there are plans to make nuclear power plants in the future. Once women including mothers are well educated and informed of the danger of nuclear energy and also if they are united, they could be very powerful and influential locally, nationally and internationally. It was after the nuclear accident in Fukushima that people began to appreciate the fact that the construction of nuclear power plants had been stopped in Kochi.

On the other hand, mothers have been discussing what to do with the nuclear accident in Fukushima and how to help victims of the huge earthquake, the tsunami and the nuclear accident. Mothers collected money (5,214,515 yen) from all over Japan and donated it to the victims in Fukushima, Iwate and Miyagi and sent necessary materials according to Mothers Newspaper[30] dated January 15, 2012. They organized a national campaign against nuclear energy and nuclear weapons on December 8 (the day when Japan attacked Pearl Harbour) in 2012. About 230,000 red fliers (which were used to draft young men in World War II) were distributed at 571 places in Japan and 4,200 mothers had peace rallies and peace march regardless of snow, strong wind and coldness. In Kochi the red fliers are used to promote peace education because it is possible to learn about the military draft using a reprint of a call-up paper. Mothers sent a letter to 300 public schools to use the red fliers to promote peace education and they have been used at 10–15 schools in Kochi. Though such grassroots movement by mothers have not been reported in the media, they have been contributing to building peace by rebuilding communities in Japan. It should be pointed out that Japanese women's movement for peace is different from women's movement in the West which "has come under fire for its white, middle-class, heterosexual, Western perspective, for operating primarily with a construct of woman which was exclusionary, partial, homogenizing and normative." (Alsop et al. 2002: 225). This is because Japan is not multiethnic society and not only middle-class women but also common women tend to take part in grassroots movement for peace.

7.4 Conclusion

Japan ranked 101th out of 135 countries in the Gender Gap Index in 2012. Japan's political empowerment rank is 110 out of 135 countries and their economic participation and opportunity rank is 102 out of 135, which means that Japanese women's participation in politics and economy is pretty low. One of the reasons is that it is not easy for women to have a job and do house chores at the same time because many men tend to be forced to work for long hours and they do not have much time for doing house chores and taking care of children. It is necessary to change working conditions of both men and women and also educate people,

[30] The number of Mothers Newspaper (*Hahaoya Shinbun*) is 4,000 and it is published monthly.

especially young people and children, about the importance of gender equality and preciousness of peace building at school and communities as well as through the media and peace museums.

Though Japanese women's political and economic position is low, they have been contributing to rebuilding community at a grassroots level in order to build peace. Why is Japanese women's status still low though they have been making great efforts for peace? It is because Japan is still a male-oriented society. However, it is encouraging that there are women's organizations that aim at improving life of women and children such as Japan Federation of Women's Organizations, the New Japan Women's Association and Mothers' organizations. It is encouraging that such women have been making great efforts to solve various issues on peace, human rights, the environment and sustainable development cooperating with women in other countries in the world. A successful case against building nuclear power plants in Kochi shows that it is important to educate women because once they are united, they can play important roles to make a great change for peace.

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Part III
Ability Expectations and Satoyama Sustainability and Peace

Chapter 8
'Culture of Peace' from an Ability and Disability Studies Lens

Gregor Wolbring

Abstract 'Culture of Peace' was discussed within UNESCO and the United Nations for decades. Human security is another highly visible concept in the UN system and directly linked to peace. This chapter contributes two lenses namely a disability studies and an ability studies lens to the culture of peace, the sustainable development and human security discourse highlighting the utility of both lenses not only for disabled people but also for defining the relationship between ability for diverse humans in general and for the human–animal and human–nature relationships.

Keywords Ability expectations · Ability studies · Ableism · Disabled people · Disability studies · Eco-ableism · Human security · Peace · People with disabilities

8.1 Introduction

The 'culture of peace' concept was adopted at the 1989 *International Congress on Peace in the Minds of Men* in Côte d'Ivoire (UNESCO 2012) and is considered as central to UNESCO and the United Nations. A 1998 resolution of the UN General Assembly (UNESCO 1998) calls

> for the promotion of a culture of peace based on the principles established in the Charter of the United Nations and on respect for human rights, democracy and tolerance, the promotion of development, education for peace, the free flow of information and the wider participation of women as an integral approach to preventing violence and conflicts, and efforts aimed at the creation of conditions for peace and its consolidation.

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According to article 1 of the *United Nations Declaration on the Culture of Peace* a 'culture of peace' is defined as a set of values, attitudes, traditions, modes of behaviour and ways of life based on among others:

> Adherence to the principles of freedom, justice, democracy, tolerance, solidarity, cooperation, pluralism, cultural diversity, dialogue and understanding at all levels of society and among nations; and fostered by an enabling national and international environment conducive to peace (United Nations 1999).

Brauch (2008: 70) highlighted how "Picht (1971) defined peace as protection against internal and external violence, as protection against want, as protection of freedom as three dimensions of political action, and thus comes close to what has been defined in the 1990s as 'human security'." Brauch (2008: 70) concluded that "no consensus on a generally accepted minimal definition of peace emerged" and that peace research focuses on negative peace as the absence of wars and other types of physical violence and on positive peace, which is about social progress and the elimination of poverty and injustice. Uvin (2008) notes that Thailand has created a 'Ministry on Social Development and Human Security' and that it also launched a 'human security index'.

An United Nations (2013) report on *A new global partnership: Eradicate poverty and transform economics through sustainable development* mentioned peace 42 times and 37 of the 102 consultation documents referred to peace.

This chapter analyses peace dynamics, a 'culture of peace', their linkage to human security through two lenses, which are mostly invisible in both discourses. Disability studies examine the impact and lived reality of disabled people (Albrecht et al. 2001; Barton and Oliver 1997; Davis 2013), while ability studies investigate which abilities are seen as essential in a given context and the impact of ability expectations and ableism (Wolbring 2008c). This chapter will use the UN report on *A new global partnership: Eradicate poverty and transform economics through sustainable development* (United Nations 2013) as a reference to approach peace through a disability studies and an ability studies lens. New aspects are introduced, which are lacking in the existing discourses such as the concepts of self-identity security and ability security as part of human security, such as ability expectation and eco-ableism to analyse a new human-nature relationship and its linkage to a 'culture of peace'.

8.2 Setting the Stage

8.2.1 The UN Report on a New Global Partnership (2013)

According to the UN report on *A new global partnership: Eradicate poverty and transform economics through sustainable development* (United Nations 2013) peace is a cross-cutting theme addressed by many goals such as "inequality, climate change, cities, concerns of young people, girls, and women, and

sustainable consumption and production patterns" (United Nations 2013: 16). Peace is mentioned under the goal of reducing poverty and classified as a non-income dimension of poverty together with "basic needs like health, education, water, sanitation, electricity and other infrastructure; basic freedoms like legal registration, freedom from fear and violence, peace, freedom to access information and participate in civic life" (United Nations 2013: 33). The report further states that by "2015, more than 50 per cent of the total population in extreme poverty will reside in places affected by conflict and chronic violence. To end extreme poverty and empower families to pursue better lives requires peaceful and stable societies" (United Nations 2013: 52).

The report calls "for a fundamental shift – to recognize peace and good governance as core elements of wellbeing, not optional extras" (United Nations 2013: 9). In order to shape the Post-2015 Agenda the report suggest that "commitments in these five areas—leave no one behind, put sustainable development at the core, transform economies, build peace and effective and accountable institutions, and forge a new global partnership—would allow the international community to keep the promises made under the MDGs, raise the bar where experience shows we can do more, and add key issues that are missing. Together, these would be significant steps towards poverty eradication as an essential part of sustainable development" (United Nations 2013: 13).

8.2.2 Human Security

Human security is seen as essential for humans in general (Commission on Human Security 2003) and for a culture of peace (Cockell 2000; De Rivera et al. 2007). Human security should be understood as a multidimensional concept to overcome the existing polarization among the three pillars of the UN: peace and security, development, and human rights (Brauch 2009). Globalization is accompanied by a "deep transformation of the modalities of power exercise …through fragmentation of decision-making, negotiations with stakeholders, cooperative action, and multiplying networks of formal and informal actors" (Milbert 2009: 239). U.N. Secretary General Kofi Annan (2001: xix), put these multiple threats to human security into perspective: "We know that we cannot be secure amidst starvation, that we cannot build peace without alleviating poverty, and that we cannot build freedom on foundations of injustice. These pillars of what we now understand as the people-centred concept of 'human security' are inter-related and mutually reinforcing" (Wisner 2009: 247). According to Kinnas "human security connects different types of freedoms—'freedom from want', 'freedom from fear' and 'freedom to take action on one's own behalf'" (Kinnas 2009: 132). Solidarity and cooperation have become imperative on our planet, which is in need of equilibrium among ethics, environment, and spirituality so that human security, including human dignity will prevail (Kinnas 2009: 139).

8.2.3 Lenses of Ability and Disability Studies

Ability studies is an interdisciplinary academic field that addresses the cultural investigation of ability expectations and preferences (want stage) and ableism (need stage). Ability Studies investigates:

> (a) the social, cultural, legal, political, ethical and other considerations by which any given ability may be judged, and which leads to favouring one ability over another; (b) the impact and consequence of favouring certain abilities and rejecting others; (c) the consequences of ableism in its different forms, and its relationship with and impact on other isms (Wolbring 2008c: 36).

Ability Studies among others investigates ability expectations intrinsic to the meaning of peace and how one can come to an agreement on which abilities are essential for a culture of peace. It identifies potential ability expectation conflicts and how one might resolve them. As such it adds to peace studies.

Disability studies is an interdisciplinary academic discipline that brings together insights from the natural sciences, social sciences and humanities to address the societal treatment disabled people encounter due to not meeting species-typical body linked ability expectations of the so-called non-disabled. Disability studies champions the social model of disability which frames problems disabled people experience as being the result of barriers that originate within the physical, social and cultural environment over the medical model of disability which locates the problem the person has as originating from within the body. One clear example of a 'disabling' environment is when people exhibit a form of ableism that expects certain body linked abilities and considers anything existing outside of these expectations to be impairment.[1]

8.2.4 Ability Expectation and Ableism

Disability studies and disabled activists were the first to look at "cultural dynamics and the cultural impact of ability preferences, coining the term ableism as a cultural concept in the process" (Wolbring 2012a). Disabled people are a social group defined by their 'deviance' from an expected set of body-linked ability expectations and they coined the term ableism to highlight the disablement, the disablism (Miller et al. 2004). The lack of support, and the active discriminations they face as disabled people because they are seen as not having the body linked abilities expected in humans (Ayim 1997; Campbell Kumari 2009; Carlson 2001; Hehir 2002; Imrie 1996; Livingston 2000; Wolbring 2008b). Ableism used in this way mimics how the terms racism and sexism are used by other social groups.

[1] See: Ayim (1997); Campbell (2008); Carlson (2001); Imrie (1996); Loja et al. (2012); Wolbring (2008a, 2012a).

However, the favouritism for abilities (want stage) and ableism (need stage) is a much broader cultural reality (Wolbring 2012b).

Ability expectation plays itself out in numerous ways beyond body related ability expectations. Every individual, household, community, group, sector, region, and country cherishes and promotes different abilities (Wolbring 2008c); some promote the ability to consume or to compete, some the ability of free speech, some the ability to act as an individual or conversely, as a community. Some have the desire to have the ability to live in peace while others thrive on the ability to generate violence. Ableism "leads to an ability based and ability justified understanding of oneself, one's body and one's relationship with others of one's species, other species and one's environment" (Wolbring 2011). What abilities become favoured and what forms of ableism one exhibits impacts how one perceives oneself, how one is perceived by others, how one relates to other species, and the human-nature relationship (Wolbring 2012b). As such this chapter presents an ability expectation analysis not only of the relationship between disabled and as non-disabled labelled people but also of the relationship between humans and animals and the human–nature relationship.

Value theory is about designing peace studies to changes attitudes and impart knowledge (Eckhardt 1984). Value theory records what people value and attempt to understand why they value certain things. While ableism is about valuing certain abilities, expectancy-value theory of achievement motivation (the ability desired) could be used to analyse dynamics of peace. Conflict theory emphasizes the possible conflict between social groups and conflict resolution is part of peace studies (Danesh 2012; Jacoby 2012; Kehoe 2012). Various ability expectations are in direct conflict with each other. Several indicators, templates, and determinants exist to evaluate progress in achieving a culture of peace[2] but which ability expectations are conducive to a culture of peace? Is there a hierarchy? Are some of the expectations outlined in the United Nations Declaration on the Culture of Peace contra-indicative? Which existing ability expectations can fulfil the present and future needs and which cannot?

8.3 'Culture of Peace' Through a Disability Studies Lens

The UN Convention on the rights of persons with disabilities highlights in the Preamble that the Charter of the United Nations perceives "the inherent dignity and worth and the equal and inalienable rights of all members of the human family as the foundation of freedom, justice and peace in the world" (United Nations 2007). The inclusion of a disability studies lens within culture of peace discourses

[2] See: Bush (1998); Coleman (2012); De Rivera (2004a, b, 2011); De Rivera et al. (2007); De Rivera and Páez (2007); Ginty (2012); Justice (2005); Kodila-Tedika (2012); Milani and Branco (2004); Morales and Leal (2004); Tasiran and Quao-Yuan (2012); Wenden (2004).

is important for disabled people and non-disabled labelled people. It is important for disabled people because culture of peace discourses set the parameters, the indicators that are to be seen as evidence of peace and they set the strategies that are envisioned to achieve the parameters and the indicators (UNESCO 1998; United Nations 1999).

Disabled people have a stake in how they can be at peace with other social groups, how a culture of peace is operationalized to achieve inter and intra social groups' peace. Disabled people feel they are in an ability expectation war with other social groups and that for inter and intra ability expectation peace is so far an elusive result. Indeed I submit that it is all the more elusive for disabled people because they are absent from culture of peace discourses including peace education. The invisibility of disabled people in the culture of peace discourse can be interpreted as evidence of a failure of a culture of peace and its discourse and comes with consequences for disabled people.

The UN report: *A new global partnership* (United Nations 2013) identified as goal 11 that one has to ensure stable and peaceful societies and states:

> Without peace, there can be no development. Without development, there can be no enduring peace. Peace and justice are prerequisites for progress. We must acknowledge a principal lesson of the MDGs: that peace and access to justice are not only fundamental human aspirations but cornerstones of sustainable development. Without peace, children cannot go to school or access health clinics. Adults cannot go to their workplaces, to markets or out to cultivate their fields. Conflict can unravel years, even decades, of social and economic progress in a brief span of time (United Nations 2013: 52).

They state further:

> To achieve peace, leaders must tackle the problems that matter most to people: they must prosecute corruption and unlawful violence, especially against minorities and vulnerable groups. They must enhance accountability. They must prove that the state can deliver basic services and rights, such as access to safety and justice, safe drinking water and health services, without discrimination (United Nations 2013: page) [and] Societies organise their dialogues through institutions. In order to play a substantive role, citizens need a legal environment which enables them to form and join CSOs, to protest and express opinions peacefully, and which protects their right to due process (United Nations 2013: 9).

Although these three quotes do not mention disabled people explicitly they are of course impacted by the problems highlighted. The report indeed mentioned disabled people in various sections:

> When everyone, irrespective of household income, gender, location, ethnicity, age, or disability, has access to health, nutrition, education, and other vital services, many of the worst effects of inequality will be over.
>
> Data must also enable us to reach the neediest, and find out whether they are receiving essential services. This means that data gathered will need to be disaggregated by gender, geography, income, disability, and other categories, to make sure that no group is being left behind.
>
> Leave No One Behind. We must ensure that no person—regardless of ethnicity, gender, geography, disability, race or other status—is denied basic economic opportunities and human rights.

> For more than a billion people, $1.25 a day is all there is to feed and clothe, to heal and educate, to build a future. We can be the first generation to eradicate this extreme poverty. This is a global minimum standard and must apply to everyone, regardless of gender, location, disability or social group.
>
> Some countries have made significant gains in the last decade in reducing disparities based on disability, ethnicity, language, being a religious minority and being displaced.
>
> Disability and ageing must be mainstreamed across policies of the government, and laws that prevent discrimination against the disabled and aged must be put in place.

These quotes are illuminating the conceptual confusion around disabled people. Some of the wording suggests that disability is a state one is in, not an identity, and disabled people are not a social group "regardless of gender, location, disability or social group". Other wordings indicate it might be an identity, a social group ('the disabled'). This discussion as to whether disability is a state or a social group has implications for disabled people such as how they are perceived and perceive themselves and what is seen as the problem and the solution to the problem. The report talks about the linkage of peace and security, the importance of land, food, nutrition, energy, job, tenure and social security, the importance of personal security and that an agenda can be built around human security.

Some human security expectations that are part of the human security discourse such as economic, health, water (Oswald Spring and Brauch 2009) environmental, community, and political security although not mentioned explicitly are covered implicitly. All security issues are also essential for disabled people. The disability studies discourse contributes two security concepts to the human security discussion which should also impact how the goals of the UN report are operationalized namely self-identity security (that one's perception of oneself is accepted by others) (Wolbring 2006, 2010) and ability security ("that one is able to live a decent life with whatever set of abilities one has, and that one will not be forced to have a prescribed set of abilities to live a secure life (e.g. even if one does not have the ability to walk, he or she should be able to secure employment" (Wolbring 2006, 2010). Self-identity security could be classified under personal and community security; it is of importance to culturally oppressed groups who are punished simply for who they are (Wolbring 2010).

Many disabled people perceive themselves in a cultural identity war with the so-called non-disabled people where their self-identity understanding of being ability diverse and ability variant, as a culture[3] and not being ability deviant and ability deficient is rejected by many. To give one example of how entrenched the deficiency view is; the concepts of cultural and biological diversity are often intertwined.[4] However, they do not converge on the level of human biological diversity as does the concept of abilities and disabilities; for example if one talks

[3] See: Barnartt (1996); Barnes and Mercer (2001); Brannon (1995); Brown (2002a, b); Connors and Donnellan (1993); Devlieger et al. (2007); Gill (1995); Lombardo (1905); Longmore (1995); Tucker (1998).

[4] See: Breckenridge (1991); Harmon et al. (2012); Rapport and Maffi (2012); Redclift (1993); UNESCO (2001).

about the possible birth of a child with Down-Syndrome one mostly hears and reads the term, 'at risk of having a child with Down-Syndrome'. Within the discourse of Down Syndrome the term risk is used to justify the availability of pre-birth tests which was first promoted for women over a certain age as they would have an 'increased risk' of a child with Down Syndrome. Factually the term to use would be 'probability'. Indeed, the probability is higher for older women to conceive a child with Down-Syndrome. Risk however is not a factual term but a cultural construction of a biased term with an attached negative judgement. Neutral language such as the following is rejected by most:

> Down syndrome is a naturally occurring chromosomal arrangement that has always been a part of the human condition. The occurrence of Down syndrome is universal across racial and gender lines, and it is present in approximately one in 800 births in Canada. Down syndrome is not a disease, disorder, defect or medical condition. It is inappropriate and offensive to refer to people with Down syndrome as 'afflicted with' or 'suffering from' it. Down syndrome itself does not require either treatment or prevention (Canadian Down Syndrome Society 2007).

The selective acceptance of biology based self-identity is a serious problem for a culture of peace. Article 1 of the United Nations Declaration on the culture of peace refers to tolerance, solidarity, cooperation, pluralism, dialogue and understanding at all levels as well as cultural diversity as essential for a culture of peace (United Nations 1999). This cannot be achieved if the very foundation of oneself, namely one's self-identity is not accepted.

8.4 Culture of Peace Through an Ability Studies Lens

Article 1 of the United Nations Declaration on a culture of peace states that a culture of peace is a "set of values, attitudes, traditions and modes of behaviour and ways of life based on among others:

(i) Adherence to the principles of freedom, justice, democracy, tolerance, solidarity, cooperation, pluralism, cultural diversity, dialogue and understanding at all levels of society and among nations; and fostered by an enabling national and international environment conducive to peace (United Nations 1999).

8.4.1 Human–Human Relationship

If we look at this list from an ability studies angle it raises numerous questions for human–human relationships within and outside of the disabled/non-disabled people dichotomy. Which abilities have to be evident for a democracy to work? Who has access to the education, learning, and training that allows one to acquire the abilities needed? Which abilities do we tolerate? Which do we promote? As to

justice, which ability inequity and ability inequality (Wolbring 2010, 2012c) do we tackle? What ability pluralism do we promote? With whose ability diversity do we show solidarity? In terms of human security, which and whose ability security do we ensure and how do we deal with ability expectation conflicts?

Goal 11 of the United Nations report is about ensuring stable and peaceful societies. As to targets they mention 11a. Reduce violent deaths per 100,000 by x and eliminate all forms of violence against children; 11b. Ensure justice institutions are accessible, independent, well-resourced and respect due-process rights; 11c. Stem the external stressors that lead to conflict, including those related to organized crime; 11d. Enhance the capacity, professionalism and accountability of the security forces, police and judiciary (United Nations 2013). I assume that ability expectations are one source of stressor leading to conflicts and it is of relevance that the United Nations report in a footnote states that target 11c of goal 11 requires further technical work to find appropriate indicators. But so far no indicators related to ability expectations and ableism exist.

8.4.2 Culture of Peace and Eco-Ableism: Human–Nature and Human–Animal Relationships

Ability expectations do not only define relationships between humans but also how humans relate to other 'biological entities' such as the Earth and animals. Ability expectations can enable or disable the relationship between humans and other biological entities. Disabled people are not the only biological entity labelled as 'ability deficient'; a label that leads to certain negative behaviours toward them. Animals and nature are two entities that can be seen in the same light. Animals are not seen as equals to humans as 'persons' (using person as an expression of legal protection) are linked to being cognitively able (Wolbring 2008c, 2011, 2012b). Indeed the ability expectation of cognition is a powerful qualifier of status. It is used to justify racist arguments (Wolbring 2008c) and is used to negatively label humans who are cognitively diverse (Carlson 2001).

As to nature, anthropocentric views of human-nature relationships are linked to humans being seen as ability superior. Nature is perceived by many as a tool to fulfill human desires. One could make an argument that many humans feel superior to nature due to the perception that nature lacks the 'abilities' seen as essential for humans; what makes humans stick out from other biological entities. Various initiatives are underway to give some animals and nature personhood status.[5] However especially around the move to give rights to the entity of 'nature' it is still not clear whether this will be operationalized under an anthropocentric view (rights to nature as a tool to have some humans fight against other humans) or

[5] Environmental law alliance worldwide (2010); Nash (1989); Revkin (2008); Vidal John (2011); Wolbring (2011).

with a biocentric view. The United Nations Declaration of a Culture of Peace exhibits the ability expectation that "developmental and environmental needs of present and future generations" are met and that we respect and promote the right to development (United Nations 1999).

The declaration uses anthropocentric language. It will be interesting to see whether recent developments around rights to nature will change this anthropocentric language within the culture of peace discourse at both official and unofficial levels. The UNESCO culture of peace and the biosphere/geosphere programmes evolved from the understanding that "peace learning was learning how to interact sensitively with the planet itself" (Boulding 2000). "The whole ecology of social relationships: the family, the school and the neighbourhood, as well as within and between nations" is seen as important for a culture of peace (Bretherton et al. 2003). The ecology of social relationship and the ability expectations define social relationships on the individual and household, community, group, sector, region, and country level are still anthropocentric and not bio/ecocentric.

8.5 Conclusion

The disability and ability studies lens introduced in this chapter not only enriches the culture of peace discourse but they are also two essential lenses to engage with if a culture of peace is to become a reality. Table 8.1 highlights seven dimensions of human security each exhibiting certain ability vulnerabilities that impact on all biological entities.

According to Kinnas "solidarity and cooperation have become imperative on our planet, which is in need of an equilibrium among ethics, environment, and spirituality so that human security, including human dignity, will prevail" (Kinnas 2009). We also need an ability expectation equilibrium and a good analysis of ability expectation hierarchies in existence and the ableism attached to certain hierarchies. Brauch (2008b) generated a table on the value at risk and sources of threat for the following security concepts (national security [political, military dimension]; societal security [societal dimension]; human security; environmental security [societal dimension] and gender security). We should include ability security and disabled people's security (Table 8.2).

Conflicting ability expectations are evident in many discourses including sustainable development and human security discourses with many ability expectations outside of a given discourse such as the sustainable development discourse being in conflict with ability expectations within sustainable development (Wolbring and Burke 2013). Ability expectation conflicts threaten the existence of peace and many ability expectations are counter indicators to peace.

Table 8.1 Human security vulnerability through an ability and disability studies lens

Seven dimensions of human security	Vulnerability through an ability studies lens	Vulnerability through a disability studies lens
Economic security (assured basic income)	Changing Ability expectations of one's body/of a biological reality	Disadvantage because one does not have the ability
Food security (physical, economic, and social access to food)	Ability to gain the physical, economic and social abilities needed to gain access	Lack of access to food
Health security (relative freedom from disease and infection)	Re-interpretation of what health is and its linkage to new ability expectations of the body	Lack of health care/new group of the techno poor impaired and disable because they do not have the new abilities
Environmental security (access to sanitary water supply, clean air, and a non-degraded land system)	Ability to protect oneself from environmental insecurity	Lack of access
Personal security (security from physical violence and threats)	Ability security	Self-identity security
Community security (security of cultural integrity)	Ability security	Self-identity security
Political security (protection of basic human rights and freedoms)	Ability being a prerequisite for political security	Lack of access

Source Compilation by the author

Table 8.2 Ability security and disabled people security

Concepts of security reference object	Reference object (security of whom?)	Value at risk (security of what?)	Source(s) of threat (security from whom/what?)
Ability security	Ability have and non-have; techno-poor impaired and disabled; ability diverse people	Ability equity; ability equality	Ability expectation hierarchy; ability diversity intolerance;
Security of disabled people	Ability have and non-have; techno-poor impaired and disabled	Equality, equity, identity, solidarity, social representations	Ability-dominant social structures, groups and individuals

Source Compilation by the author

Various conflict resolution mechanisms exist[6] as do conflict maps and conflict studies. However, conflict resolution has not been explored systematically through an ability expectation lens which is needed.

Brauch stated that "the enemy is us, not 'they' (the rival social class, religious or ethnic group, nation or alliance), it is 'us', 'our consumptive behaviour' and 'our use of fossil fuels' (coal, oil, gas) and that of previous generations since the outset of the Industrial Revolution (ca. 1750) that has been accumulated in the atmosphere and has become the cause of a rapid anthropogenic climate change" (Brauch 2009: 66). The enemy reflects the detrimental use of ability expectations (i.e. competitiveness, consumerism, productivity, cognition) to secure hierarchies between social groups and the superiority of the entity human over other biological structures. As ability expectations play themselves out today peace will be hard to realize. To bring ability expectations as a factor that can enable and disable a culture of peace an ability expectation conflict map is needed which among others would reveal ability expectation hierarchies and difference in ability expectations between social groups. This map could be used to investigate whether existing conflict resolutions work on ability expectation conflicts. Finally self-identity and ability security are two concepts that might help advance discussions on the culture of peace.

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[6] See: Bonta (1996); Borel et al. (2011); Carter (2012); Ramsbotham et al. (2011); Sandole (1993); You Can Canada (2013).

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Chapter 9
Converting the Forces of Nature into a Cultural Force: An Invitation to Pursue the Study of Satoyamas

Ryotaro Katsura

Abstract After Word War II, the Japanese Government focused on economic growth, and hence the growth of cities, and has started to reform systems related to environmental preservation. We have lived through the coastal effects of the tsunami and the nuclear power plant accidents caused by the unprecedented great earthquake. These experiences lead us to radically reconsider human beings' relationship with nature. Satoyama Studies is a source of ideas for reintroducing the forces of nature to human culture to create a way of life where humans coexist with nature, recovering quality of life while restraining unlimited economic growth. This chapter introduces the importance of Satoyama Studies as a form of local research, it reviews the Old Calendar as a cultural force, and the value of Satoyama Studies as a source of education about how to live and also how to prepare for death, and the discovery of the practice of tree burial, and it attempts to explain why Satoyama Studies are important for peace building.

Keywords Cultural force · Death education · Force of nature · Local research · Old calender · Peace study · Satoyama studies · Three nuclear crises · Tree burials · Welfare studies

A Satoyama may be only a little village near the mountains, only at best a Satoyama. Yet, even so, it is a Satoyama.

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9.1 Three Values (3 'Yu') Arising from Satoyama Studies: 'Yume' (Dreams), 'Yutori' (Leaving Space), and 'Yuki' (Courage)

The terms *Yume* (dreams), *Yutori* (leaving space), and *Yuki* (courage) are magnificent Japanese words. *Yume* connotes ideas, *Yutori* is a technique, used for example in the Japanese woodblock prints referred to in English as 'the floating world', and *Yuki* is putting ones ideas into practice. *Yutori* has various meanings. It refers to allowance in terms of time and space, to allow the mind to float freely, or drift with the currents of thought. As all three Japanese words begin with 'Yu', they are used as a poetic framework, keeping in mind that the Japanese love their 'Yu' (hot springs)!

The experiences of the unprecedented earthquake of 11 March 2011 helped some Japanese to radically reconsider human beings' relationship with nature. Satoyama Studies is treated as a source of ideas for reintroducing the forces of nature to human culture to create a way of life, where humans coexist with nature, recovering true quality of life while reining in unbridled economic growth.

Satoyamas occupy the geographic space between Okuyamas (mountain recesses) and urban areas, and therefore they also represent a certain cultural space. The Japanese use of rice, green tea, and bamboo were all born from this place between the wilderness of the mountains and densely packed cities. Modernization has taken a heavy toll on the Satoyama. We cannot say a place fulfills the definition of a thriving Satoyama unless both animals and plants are living there with the aid of humans.

That is why the Satoyama is a space where the harmony between nature and humanity can be recovered. After Word War II, the Japanese Government focused on economic growth, and hence the growth of cities, but now it has recognized the importance of preserving the environment. Japan has started to reform systems related to environmental preservation, and this includes recognizing and supporting the Satoyama. In Western countries, the closest thing to Satoyama Studies is the Permaculture Movement. Austrian Sepp Holzer, Australian Bill Mollison, and American Toby Hemenway join Japanese Masanobu Fukuoka in their quest for a sustainable and natural human-scaled way of raising food and living harmoniously with nature (Maruyama 2012).

This chapter introduces the importance of Satoyama Studies as local research. In Sect. 9.1.2 on *leaving space*, the Old Calendar is reviewed as a cultural force, and the value of Satoyama Studies as a source of education on how to live and to prepare for death, and the discovery of the practice of tree burial. Finally, the chapter argues why Satoyama Studies are important to everyone.

9.1.1 Dreams: A Dream of Participating in Satoyama Study as an Exercise in Local Research

Tokuji Maruyama argued in his book, *Satoyama Governance* that Satoyama Study can help lead to solutions to threats to the environment. He stated that Satoyama-style natural living is a part of the road to a sustainable society. While clarifying the traditional methods and measures by which Satoyamas are maintained, he uncovered hints to how these methods can be used nowadays. He defined Satoyama study as a practical means of preserving Satoyama-style nature now and in the future. Various disciplines (natural and social sciences, humanities) must cooperate, and specialists and governments must support this project of finding ways to live lightly on earth (Maruyama 2012).

Satoyamas (the human-influenced land and inhabited villages in the vicinity of mountains or close to other wild places) are non-urban resting places, set apart from urban settings. They are spots for people to recover their humanity. Satoyama Studies may even be practiced in an urban setting. People living in the city may find an opportunity to discover the value of Satoyama Studies in a local setting. For example, consider the' Inochi no Mori' (Forest of Life) that was established by citizens at a park in Osaka City. Utsubo Park in Nishi Ward in Osaka City was once an US military airport. After the U.S. forces left, the park provided natural space for businessmen and young couples to enjoy. After a while the city was closing in on it and threatening its natural beauty. That spurred the people to call for preserving nature in Utsubo Park and they requested the Osaka City government to create 'Inochi no Mori' (the Forest of Life) within this park. Park visitors were prohibited from entering this area, where trees and grasses began to grow, and insects, frogs, and lizards returned, as well as birds to eat them. This is an example of a Satoyama space created in an urban environment.

The regenerative activity of the 'Inochi no Mori' made people aware that there were a huge number of buildings and much infrastructure, including Utsubo Park itself, that had been totally destroyed by US Air Force bombing attacks during World War II. The area had been flattened. The reconstruction of this wasteland to create a Satoyama park was partly to memorialize (see Sect. 3.7, this volume, for a discussion of memorialization) the history of war. Therefore, this former airport (a remnant of the forces of destruction) was converted to a vibrantly alive woodlands park within an urban complex.

I found a new lifestyle in Satoyama Studies as an extension of my local research at a rural Takayama site in Ikoma City, Nara (close to Osaka). I plowed idle land (once used for growing farm produce but then left uncultivated) with volunteers who lived near there (members of the committee to create Takayama Satoyama Park, Ikoma) and students (including foreign students). In addition, we now hold meetings four times per year (Spring, Summer, Autumn, and Winter) to discover the treasures of Takayama, Ikoma by performing local research. We divide into groups and teach each other various subjects, including local natural history, cultural environment and history, and images of the future.

This Takayama area is full of cultural treasures related to bamboo, green tea, and rice culture. The 'Ikoma Takayama Bamboo Forest Park', has a collection of bamboos from all over the world. More than 90 % of all chasen (tea stirrers: a tool used for the tea ceremony as established by Rikyu Sen: 1522–1591) are manufactured in Takayama. The Nara Institute of Science and Technology in Takayama researches bamboo and the improvement of rice varieties (especially yamato rice and old strains of rice). There are a multitude of treasures that arise from the combination of natural and cultural elements in Takayama. Finding these treasures is also one of the appeals of local research. The study of the wisdom of the people of antiquity, arising from our Satoyama Studies, is used to develop new images and reveal wellsprings of creativity to solve the problems of the future, such as food, energy, and care (FEC).

9.1.2 Leaving Space: Applying the Old Calendar as a Path to Leaving Space in Life for Taking a Breath and Enjoying True Affluence

While plowing our fields, we began to arrive at the understanding that agricultural produce—including rice, vegetables, and potatoes—used to be grown on the basis of the old calendar (a calendar that divides time in relationship to the phases of the moon and other natural phenomena). A local farmer instructed us that it is better to seed rice when the cherry trees are starting to blossom. Therefore, we have begun managing our farm activities and ceremonies (marriages, funerals, veneration of our ancestors, and festivals) using the old calendar, not the Western calendar.

Japan changed from the lunar to the solar calendar on 1 January 1873. When Japanese adopted a new calendar and abandoned the old one, we also began converting all our habits of life and our customs from the old familiar ones to Western practices. However, some Asian nations still use the old calendar, in parallel with the solar calendar. For example, in Viet Nam, many people who live in large cities return to their hometowns at 'Tet' (New Years Day in the old calendar), and they reaffirm and reinforce their ties with their relatives and thank nature and the wooded lands supporting a natural life.

I was told by Mr. M., a man who pursues Satoyama Studies, that it is important to return to the old calendar if we want to recapture a slow-paced life and escape from the super busy lifestyle of modern people. He said this old calendar provides an explanation of the recent deviation, in the modern calendar, of the emergence of cherry blossoms over the years.

The oldest calendars were based on lunar months, which results in a year of 354 days. This is 11 days less than a solar year. Long ago people realized that they could not time their agricultural activities by reference solely to a lunar year, so accommodations were made in various cultures to adapt the lunar calendar to harmonize it with solar cycles. The equinoxes and solstices were used as anchor

points in the yearly round of days. In Japan we added 'leap months' so we could have the benefits of both the lunar and solar calendars. We needed a calendar that related accurately to natural signs, and the timing of the blossoming of our cherry trees is a natural event that is very important to Japanese. People raising crops and animals have observed over millennia that the growth and lifecycles of plants and animals follows the moon. They observed that during the full moon, sap tends to rise in trees, and growth spurts occur. This affects when cherry trees, for example, will bud, and when the buds will open. The solar calendar, however, does not give such a good clue to when cherry blossoms will appear.

Surely modern people using the Western calendar do enjoy the emergence of seasonal flowers and the circle of the seasons. The people of antiquity, though, while enjoying the changing seasons and planning their agricultural activities, also used their calendar as a basis for their round of festivals, thus emphasizing the relationship of time to human life-cycles and ties. In many countries in Asia, the old calendar is still used to structure daily life and to schedule important events each year. The old calendar may be a symbol and even a tool of a culture that supports the breathing space in Asia.

The Old ones celebrated a life enriched by green tea, rice, and bamboo, during which they enjoyed and performed the work of each season, chatted with neighbours, and observed ceremonial occasions that marked and honoured the cycle of nature. Now, even when we provide care for the aged in Japan, these elements are seldom observed. Another example of leaving space for nature is provided by the Japanese permaculturist, Masunobu Fukuoka, who 'tried to take the human intellect out of the agricultural decision-making process' (Miyaura and Maruyama 2009).

9.1.3 Courage: The Satoyama as a Place for Preparing for Death: Discovering Tree Burials

With regard to the preparation for death, Satoyama and peace studies may be linked because every life is born from the soil and returns to the soil. Harmony between nature and humanity sustains our human lives. It would be difficult to continue to live without the natural woodland areas, which are the source of the soil from which we arise. It was Gandhi who said, "Learn the soul of peace from the soil."

Woodlands are an example of nature, and the source of culture is our relationship to nature, thus the woodlands are an expression of religion and culture. To attack nature means to attack and weaken the culture humans painstakingly constructed. One of the largest effects of this destruction is war. If people treat their religion as a rigid mechanism, then they are seeing nature as a mechanical robot. In the end, nature will flee from human society, and any hope of a peaceful way of life will go up in smoke.

Tree Burials: One way of making clear that we respect a person's values and ways of thought is to respect his or her wishes regarding the funeral that person

wants. In a tree burial, human remains are buried underground as a graveyard, with a tree used as the grave marker. There are some cemeteries where the whole area is reserved exclusively for tree burials, and some other cemeteries specify that a part is designated exclusively for tree burials. In Japan, the first tree burial cemetery was established in 1999 in Ichinoseki City, Iwate in harmony with the natural environment in the surrounding area, where only low trees or bushes are used as grave markers *Hanamizuki* (flowering dogwood), crape myrtle, *umemodoki* (Japanese winterberry), *Ezoajisai* (hydrangea), *mushikari* (viburnum), *tsuribana* (Korean spindletree), and maple are used. The trees are selected on the basis of whether they can be grown locally and whether they will be compatible with the local ecological system. Living as we do in the slender islands of Japan, the only way that we can now return freely to the ground after we die is to be buried under a tree, not confined to the tiny space in our family's tomb.

Peace and human welfare studies may sensitize people that they need to study deeply the phenomenon of death (i.e., education in preparation for death). The woodlands may be the most suitable places for this education about death. Learning about tree burial offers an opportunity to review one's own attitudes toward death and life, as well as various ideas about values and ethics.

9.2 The Three Crises that Threaten Human Beings and How They Intersect with Satoyama Studies

After World War II, the global culture affected Japan, which now faces three crises. The first affects the *physical* body (as a material object), the second is the crisis of the *living* body (the result of a biological process), and the third is that of the *social* body (the outcome of the interactions of many beings).

An example of the first crisis (for the physical body) is the radioactive contamination resulting from the nuclear power generator accident. An example of the second crisis (to the living body) are biochemical hazards such as dioxin, cloning technology and chromosome manipulation. The third crisis (to the social body) is the crisis of the family system, what includes social problems, typical family dysfunction and the collapse of families.

We face the issue how we should solve them. After the great tsunami and the nuclear power plant accidents caused by the Great Tohoku Earthquake and huge floods caused by climate change to overcome these crises our attitudes toward life, our views on death, and our ideas about history must be reviewed. Returning to the study of the cultural forces that can be found in the traditional spiritual realm will be beneficial, especially the innate ability of human beings to feel themselves at one with the natural universe in which they live. That is a resource from which people can derive a philosophy of value based on natural forces.

Thus, we need to depart from the principle of competition (prioritizing economic growth), and re-examine human culture from the perspective of nature. Satoyama is a repository of the strength of culture and we must look back on past

history. The three major cultural icons of Asia: green tea, rice, and bamboo, were all born in the Satoyama. Humans may forget that the Satoyama is the root of the origin of these cultures. This implies that the cultures of other continents also arose from the roots of nature in those lands.

Using radioactive and biochemical weapons has destroyed nature and even caused the breakdown of our human cultures and societies. In Japanese culture the Chasen can only be made from Japanese bamboo that has grown through four or five Japanese winters. To maintain timber bamboo groves, farmers must go into the woodlands and remove any other wild plants, to provide sunlight to the bamboo. To keep producing these little tools for the tea ceremony, which are important to the Japanese way of being, the 'wabi' (a taste for the simple and quiet) and 'sabi', (elegant simplicity) it is necessary to preserve Satoyamas (Characteristics of the wabi-sabi aesthetic include asymmetry, asperity (roughness or irregularity, simplicity, economy, austerity, modesty, intimacy and appreciation of the ingenuous integrity of natural objects and processes). Contemporary Japanese should now link the study of wild woodlands with peace and human welfare, and bring to everyone's attention how ridiculous war is. This can be a Japanese contribution to raise the likelihood of actual peace and human welfare.

9.3 Satoyama Study is Another Way of Linking the Past with the Future

The term Satoyama refers to forests and grasslands near villages, which have been slightly modified by human activity, while the term 'Satochi' refers to areas more clearly modified for human use, including agricultural lands, villages, and water sources. Some say it is 'nature as culture'. Satoyama studies are not only about the regeneration of nature, but are also at their core about the regeneration and reformation of 'nature as culture'. It is about putting human beings back into nature, and putting nature back into human beings. Since the Jomon era (c. 8000 to 200 BC), Japan's ancestors derived their cultural energy from the blessings of the Satoyamas. Satoyama Study is a pursuit that eliminates the barrier between specialist (scholars) and amateurs (citizens), stepping outside the framework of conventional academism.

Satoyama Studies not only link the past and future, but are also a field of intermediation linking citizens and specialists. Practicing life in harmony with nature, relearning how to live simply and tending to ones crops, the 'generalist' citizens and the 'specialist' academics can teach one another, and grow together. Satoyama Studies are a kind of practical research leading from the preservation and regeneration of the ways of life developed while surrounded by woodland nature and the Satoyama itself, to a sustainable society, and finally to a peaceful global citizenry (the 'Global Village'). Satoyamas are important geographical spaces related to the living zones inhabited by humans, which can be made affluent through human agency, unlike the *Okuyamas* (mountain recesses) located far from villages (Yuki 2009).

Humans ventured into an easy and wrong way of assuming that they could control nature, and they have significantly damaged the expressions of nature around them by their desires and lusts to capture and control the things in front of them. Thus, humans have been completely overcome by a force of nature they never could have previously predicted. Now they have to come to grips with the existence of the two faces of nature: nature as a threat and nature as a healer. It can heal human society and can help create cultures. Humans must pass on to the next generation of children a recognition of these two aspects, and they can do that through Satoyama Studies.

In the modern age, where the world is classified into the natural and the social, the obvious idea is that natural science was developed to comprehend nature, and social science and cultural science were developed to comprehend society and culture. These two branches have been developed, specialized, and elaborated in various ways, leading them to become quite different fields of study. Hopefully Satoyama Studies will develop to become a study pursued by global citizens, combining, blending, and mediating among the existing sciences.

Lastly, while looking ahead to the prospects for the 22nd century, it will not be possible to completely eliminate wars on earth unless we are willing to constrain human lusts and desires. This may be achieved by a deep face-to-face encounter with natureby re-studying how to live and how to die, learning from nature. Thus, nature should be called Satoyama, the place where man and the wilderness interact.

The author's study team. *Source* This photo was taken by the author who granted permission to use it.

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About this Book

This book has peer-reviewed chapters by scholars from Australia, Canada, Germany, Japan, Mexico, and the USA that were presented to the Ecology and Peace Commission (EPC) of the International Peace Research Association (IPRA) in November 2012 in Tsu city, Mie Prefecture, Japan. The chapters address these themes: Expanding Peace Ecology—Peace, Security, Sustainability, Equity, and Gender; Two Discourses on Global Climate Change Impacts: From Climate Change and Security to Sustainability Transition; Peace Research and Greening in the Red Zone: Community-based Ecological Restoration to Enhance Resilience and Transitions Toward Peace; Social and Environmental Vulnerability in a River Basin of Mexico; Mobile Learning, Rebuilding Community Through Building Communities, Supporting Community Capacities: Post Natural Disaster Experience; Transforming Consciousness through Peace Environmental Education; Building Peace by Rebuilding Community; Ability Expectations and Peace and on Satoyama Sustainability and Peace.

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