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List of Abbreviations

BCE	Before the Common, Christian, or Current Era
BCM	Billion cubic metres
EEC	European Economic Commission
EPA (Australia)	Environment Protection Authority
EU	European Union
FAO	Food and Agriculture Organisation (UN)
ILC	International Law Commission
IWA	International Water Association
IWHA	International Water History Association
IWRM	Integrated Water Resources Management
MCM	Million Cubic Metres
MDGs	Millennium Development Goals
MERCOSUR	Southern Common Market, Sp: Mercado Común del Sur, Por: Mercado Comum do Sul
OKACOM	Permanent Okavango River Basin Water Commission (Angola, Botswana, Namibia)
PLO	Palestine Liberation Organisation
RSFSR	Russian Soviet Federated Socialist Republic
SADC	Southern African Development Community
UN	United Nations
UNECE/ECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
UNWWDR	United Nations World Water Development Report
US	United States
USC	United States Congress
USSR	Union of Soviet Socialist Republics
WFD	Water Framework Directive (EU)

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Part I
Introduction

Chapter 1
The Evolution of Global Water Law

Joseph W. Dellapenna and Joyeeta Gupta

Abstract This chapter presents an overview of global trends in water law and policy and assesses current global water governance. It identifies the key purpose of this book as providing an historic understanding of how and why after 5,000 years of water governance, that governance still has not reached stability. It identifies the key research questions for this book. It provides an overview of the current global water governance regime, its evolving characteristics, and the legal theories involved in these changes. It focuses on water law and discusses the characteristics of national, supranational, and international water law. It then introduces the chapters of the book and explains how these chapters together provide a comprehensive assessment of the state of water law today.

Keywords Sustainable development • precautionary principle • water law • water policy • water governance

1.1 Introduction

The twenty-first century faces the challenge of sustainable resource governance. If previous centuries were about resource discovery, exploitation, technological mastery, and wealth, we now face the prospect of seeing our resources dwindle and disappear if humans are not able to find ways to use resources sustainably. If previous centuries were about individual resources, this century is about how these resources relate to each other and how use in one field affects uses in other fields. If previous centuries located water governance in the hands of governments

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and privileged social actors, this century is beginning to see the end of the exclusive monopoly of the state and those it privileges to control resources; instead, pluralist visions of multiple stakeholders engaging are becoming a reality. Whether these stakeholders are able to make legitimate, accountable, and transparent policy in conformity with the rule of law remains to be seen.

Against this background of the changing nature of resource management and the changing nature of governance itself, this book focuses on the key questions: How has water law and policy evolved through the centuries? What were the motivating factors that led to changes in legal and social practices? Why is it that after 5,000 years of governing the water resource, we appear to be not much closer to understanding and addressing water governance than at the beginning? What are the current challenges facing governance today? And what is the role of water law in the evolving structure of water governance in the twenty-first century?

This chapter provides a brief overview of the current global water governance regime and how this regime reflects on changes in governance regimes (see §1.2). It then surveys the history to provide initial insights about how water law has developed nationally in different parts of the world (see §1.3). It assesses how international water law has evolved over time and the challenges in developing a global water law (see §1.4). Finally, it presents an overview of the various chapters in this book, before drawing some conclusions (see §1.5).

Before moving further, it may be appropriate to define a few terms. Society is moving from government to governance. The Commission on Global Governance (1995: 2) defines governance as: "the sum of the many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and cooperative action may be taken." As Rosenau (1992: 4) explains: "Both terms refer to purposive behaviour, to goal-oriented activities, and to systems of rule, but government suggests activities that are backed by formal authority whereas governance refers to activities backed by shared goals that may or may not derive from formally prescribed responsibilities and do not require police powers to ensure compliance." Law and policy are a subset of governance and refer to the traditional actors engaged in policy making. "National law" refers to law made within the domestic systems of countries, "supranational law" to the law being developed on a regional basis, as within the European Union, while "international law" refers to customary international law and the agreements (multilateral, regional, and bilateral) made between nations. National water law is a subset of national law, referring to numerous different domestic laws that impact on water governance—such as irrigation law, energy law, health law, as well as what has been referred to as water resource law. Similarly, international water law is a subset of international law, focusing on the governance of international freshwater. By water policy, we mean systems of water management that are expressed in legal doctrines or governance institutions. Because governance increasingly includes the role of non-state actors, we also look at the role of private sector participation and public participation in water policymaking.

This book focuses primarily on water law and policy. Section 1.2 highlights the key features of the global and national water governance regime as an overview of

the key developments including the changing characteristics of governance, while the following sections move to focus especially on water law and policy developments.

This book may be seen as a contribution to the ongoing work of the Global Water System Project and the Earth System Governance Project of the International Human Dimensions Programme on Global Environmental Change. The former project focuses, inter alia, on governance and the global water system, and how societies adapt to water challenges. The latter focuses on understanding governance in terms of architecture (emergence, design and effectiveness of governance), agency (roles and responsibilities of different actors in governance), adaptiveness (how societies adapt to different challenges), accountability and legitimacy (how authority is conferred upon systems and used), and access and allocation (how access to resources is arranged, e.g., through human rights, and how scarce resources are allocated among different actors and countries). By examining the evolution of law and policy processes in communities, and at national, supranational, and global level, this book contributes to the general understanding of the Global Water System Project. By exploring how the human right to water is dealt with, how scarce water is allocated between countries, how water quality issues are being dealt with, how responsibilities have shifted over time between social actors at different levels of governance, we examine issues of architecture, agency, adaptiveness, accountability and access and allocation.

1.2 The Current Global Water Governance Regime

Although water has long been seen as primarily a local issue, increasingly four arguments are made for the need for global water governance. These are: (a) recognition of the global nature of the hydrological system and connections with other global resource systems; (b) recognition of the interrelationship between global environmental change and socio-economic processes, because of which the driving forces of problems are beyond national or regional jurisdictions; (c) local phenomena may cumulate to serious global trends that require a global approach; and (d) the direct and indirect impacts of changes in water management may have global repercussions (Pahl-Wostl et al. 2008).

Global water governance is diffuse and the related international law, while binding, suffers from the shortcomings of international law generally. Furthermore, global water goals are defined but scarcely adequate or achievable, and UN water policy is work in progress. Global water meetings and discussions provide only an elusive arena of global governance and global water ‘ideology’ is marketed through a variety of instruments worldwide. These are briefly explained below.

1.2.1 The Forms of Global Water Governance

Global water law today refers to the customary international law applicable to water resources and the various treaties created to govern the use or protection of freshwater resources (Dellapenna 1994, 2001). The UN Convention on the Law of

the Non-Navigational Uses of International Watercourses adopted in 1997 ("UN Watercourses Convention") is not yet in force and may not enter into force in its current incarnation. Because this instrument (see §1.4) is conservative in its approach to international water law, it scarcely attempted to address the water challenges of the twenty-first century and was out-of-date even before it was adopted (Dellapenna & Gupta 2008).

The lack of progress on water issues drove the international community to adopt the Millennium Development goals, including the goal 'to halve, by the year 2015, … the proportion of people who are unable to reach, or to afford, safe drinking water', and the need to halt unsustainable water use (UNGA Res. 55/2, 2000). Two years later at the World Summit on Sustainable Development in Johannesburg in 2002, an additional goal was adopted, aiming to halve, by 2015, the proportion of people without access to basic sanitation. Although these goals are in place, they are inadequate, focusing as they do on only halving the number of people without access to water and sanitation, while the resources invested in implementing these goals are limited and these goals may not ultimately be implemented (UN Millennium Project 2005: 163). Efforts to counteract this half-hearted effort through legal means were begun in March 2008 with the appointment of a Special Rapporteur who is to flesh out the elements of a human right to water within the next 3 years. The eventual adoption of such a right in a human rights convention is a logical follow-up to the General Comment on the Right to Water adopted by the UN Committee on Economic, Social, and Cultural Rights in 2002; it would create legal obligations on states to provide residents with access to water and legal instruments for enforcing such obligations.

Global UN water policy began with the Declaration of the UN Conference on the Human Environment in 1972, followed by the Mar Del Plata Conference in 1977, the UN Water and Sanitation Decade in the 1980s, the adoption of Chapter 18 in Agenda 21 and the Rio Declaration at the UN Conference on Environment and Development in 1992, and the Johannesburg Conference on Sustainable Development in 2002. The follow-up to the last conference within the UN Commission on Sustainable Development remains a work in progress. There is today no global water policy framework (Pahl-Wostl et al. 2008; see Farrajota this book). In an effort at coherence, the 25 UN agencies working on water have now united under the banner of UN Water.

Non-UN meetings that have contributed to the emergence of a global water policy include the Dublin Conference of 1992 with its four water principles (the notion of the finite and necessary nature of water, the need for a participatory approach at all levels of management, the central role of women in water management, and the need to recognize water as an economic good) and the establishment of multi-stakeholder forums such as the World Water Forum and its meetings every 3 years, the World Water Council, and the Global Water Partnership. These bodies discuss water issues and come up with a number of proposals but these are not embedded in international agreements and therefore provide only a background community for global water governance rather than a formal, legal structure (Gleick & Lane 2005).

At present, there appears to be a growing ideological dominance of neo-liberal ideas and these also influence the water sector. The notion of water as an economic

good, where the private sector should have a key role, is increasingly marketed by non-UN meetings (e.g., Dublin Declaration), the economic literature, aid agencies, and development banks. With the recent incarnation of the social human rights discussion within the Human Rights Council, some competition between the needs versus rights discussion is currently emerging. The contemporary dominance of highly varied water actors in global governance has led to a situation in which many are not aware of the long history of water law in water governance.

1.2.2 The Changing Characteristics of Governance

As we move from government to governance discourses at national through global levels, there are different shifts. Building on Kersbergen and Waarden's (2001) five generic shifts and Krahmann's (2003) seven generic shifts, we conclude that in water governance there have been seven interrelated fragmentations of water governance. First, *geographical fragmentation* of authority implies the shift of authority upward from states to supranational (e.g., European Union) and international authorities (e.g., World Trade Organization; Helsinki Watercourses Convention 1992) and downwards to catchments and communities. Hence, water governance can be characterized as *multi-level governance* where state authorities from the local level, through provincial, national, regional, sometimes supranational, and global levels have a say about how water should be governed. Second, *functional fragmentation* refers to the shift in authority to specific bodies (e.g., water multinationals; development banks; World Commission on Dams) that are relevant in terms of functions. Krahmann argues that this has implied a shift to market actors and individualism from guardians of public interests. Third, *resource fragmentation* is the movement of resource control from the sovereign to dispersed social actors. Fourth, *interest fragmentation* shifts the focus from the public interest that seeks to reconcile different interests to a vision of pluralist interests that cannot be aggregated in a common vision of the public interest. On the one hand, there is the notion of civil society and citizenry that sees the importance of direct democracy and engaging the beneficiaries of the water regime in water governance. On the other hand, there are organized stakeholders, private entities including multinationals, non-governmental organizations such as water organizations, professional communities, and a somewhat less organized epistemic community in water (*cf.* Conca 2005). All these communities have their own ideas about how water governance should be organized. Fifth, *norm fragmentation* has shifted from being centred on national sovereignty and command and control towards limited sovereignty, self-government, and the marketization of social relations. Sixth, *policy fragmentation* has broken down existing sectoral policy making in favour of still emerging integrated policy making that recognizes the larger role of water in society, a shift towards integrated water resources management and integrated environmental management, where water is one of the resources in a complex nexus of resources needed for human and ecosystem development. Thus at the UN,

e.g., 25 UN agencies have been united under UN Water to ensure coherence and consistency of policy approaches. And seventh, *decision-making and implementation fragmentation* moves from hierarchical and centralized decision making to diffuse decision-making. While policy implementation was authoritative and could be enforced by coercive means, today the focus is on self-regulation (e.g., codes of conduct), voluntary participation (e.g., eco-labelling), and decentralization. Shifts downward increase the compliance pull of decisions; shifts upwards increase the political effectiveness of transboundary decisions; shifts to non-state actors counteract the resultant declining authority of states (Gupta 2003).

1.2.3 Theories of Change

Although in common law systems, there long has been a general balance of power between branches of government, increasingly for civil law systems, participants perceive a shift from legislative to judicial governance such as the European Court of Justice and the International Court of Justice (Kersbergen & Waarden 2001). For both legal traditions, there is moreover a shift from both legislative and judicial governance to administrative governance (Kingsbury et al. 2005; Krisch & Kingsbury 2006). Furthermore, a spread of authority to different levels of governance results in multi-level governance (Winter 2006). The European Union provides examples of how the different levels cooperate and compete to manage their own resources. While the subsidiarity principle leads to a shift in water resource management to the lowest administrative levels, the notion of common interest and externalized impacts tends to lead to a concentration of decision-making power at the European Union level. The spread of authority to different actors in the system is seen in a positive light by legal pluralists as a recognition of the true pluralist interests that cannot be aggregated in universalist approaches (Krisch 2006: 248) or in a negative light by fragmentation scholars who see the disaggregation of interests and policies as leading to a breakdown in legal approaches.

The merger of public and private national and international spheres has inevitably led to merger and competition between public international law and private/commercial international law. Increasingly this means competition between international and global water law (diffuse and unclear as it often is) and trade (highly centralized and relatively clear) and investment law (highly pluralistic but nevertheless legally binding). The increasing private sector participation in the water sector and the concurrent internationalization of the sector has led to water litigation or arbitration following water contract failure. The initial judgements are not always favourable to environmental issues and tend to protect the investors (Gupta 2004; Tecco 2008).

Finally, although it is more appropriate to talk in a context neutral manner about global governance, it is becoming increasingly obvious that there are major differences of opinion between North and South, between East and West, and within regions. Focusing here on the North–South divide, there are increasing calls for third world approaches to international law. This school of thought sets itself up as

a countervailing power to the dominant modes of legal governance (Chimni 2003; Sornarajah 2006).

1.2.4 Inferences

This section argued that global water governance is diffuse and global water law and policy is dispersed in a number of separate activities (water law; human rights; millennium development goals; water policy). Non-UN and multi-stakeholder efforts are presently dominant with their mega conferences and while this has increased the global visibility of the water problem, it has not led to concrete decisions. The forces of globalization, however, are conveying the ideological message of water as an economic good and the need for private and public participation through aid agencies, multinationals and development banks. The shift from government to governance in water is accompanied by seven fragmenting shifts in terms of geography, function, resources, interests, norms, sectoral scope, and policy making and implementation. Finally, although positivist lawyers would regard these shifts perhaps as less than significant, there is an increasing group of non-positivist lawyers who observe the changes in global phenomena in theories on administrative law, legal pluralism, legal fragmentation, and multi-level governance. Both the tendency to concentrate decision-making in centralized, universalistic approaches and the tendency to disperse it into pluralistic arenas meet criticism from third world approaches to international law. One could even argue that the differing developments in differing areas reflect fuzzy governance, one that scarcely qualifies to be called a global water governance regime.

1.3 The Evolution of Water Law

Today, water law and policy are a patchwork of local customs and rules, national legislation, regional agreements, and global treaties creating a global legal governance framework. This framework results from complex historical evolutionary processes. Each aspect of this system is briefly summarized in this section.

1.3.1 National Legal Systems

The oldest water laws can be traced back to the earliest human civilizations, the Chinese, the Indus, the Egyptian, and the Mesopotamian (see Kornfeld, this book), developing first in what are currently the poorer regions of the world. These and later water law systems reflect the *cultural origins* of law. History shows that water law

has developed in a highly contextual manner reflecting the historical, geographical and political contexts of the countries concerned. As a result, today there are 192 different national water law systems, each with country specific characteristics. At the same time, there are a number of unifying forces that have spread common principles of water law to different parts of the world. These include: (a) the spread of civilizations (see Kornfeld, this book); (b) the spread of religion (see chapters by Naff; Laster et al.); (c) the impact of conquest and colonization (see Cullet & Gupta; Farias; Kidd; McCay & Marsden; Van der Zaag; this book); (d) the codification of legal principles (see §§1.3.3); (e) the rise of epistemic communities (see Gupta & Dellapenna, this book); (f) the influence of environmentalism (see almost all chapters); and (g) the second wave of globalization (Gupta 2003). These various influences overlapped and often continue to co-exist within a single society, resulting in plural systems of water law competing for application (Gupta & Leenderste 2005; Cullet & Gupta, this book), although recent decades have seen efforts to integrate different regulations into one comprehensive water law (see chapter by Farias on Brazil; chapter by Kidd on South Africa). These issues are discussed in greater detail in the last chapter of this book.

1.3.2 The Evolution of National Through Supranational Water Law in Europe

The leading example of supranational water law and policy is Europe (see Canelas de Castro, this book). With the establishment of the European Community in 1970, an impetus was given to coordinate water law in the region. In the first phase (1973–1988) water policy and law focused on water quality issues and standards (e.g., Directives on: Drinking Water; Bathing Water; and the Quality of Fresh Waters Needing Protection or Improvement in Order to Support Fish Life). In the second phase (1988–1995) the focus was on emission standards (manure disposal) and water treatment (e.g., Directives on: Cadmium, Hexachlorocyclohexane, Nitrates; Integrated Pollution Prevention and Control; and Urban Waste Water). In the third phase, the European Union created a comprehensive policy through its Water Framework Directive 2000. This directive has an eco-centric logic, aims at good status for all water bodies and at management at the river basin scale, and includes a wide variety of instruments. This Directive applies to all European Union member states (Aubin & Varone 2004).

1.3.3 The Evolution of International Water Law

Although international water agreements can be traced back some 800 years, modern international water law essentially has developed only in the last two centuries. International law provides the institutional framework, the rules for

treaty making, interpretation, and dispute resolution, for countries to work together peacefully (UN 1969). This section briefly discusses global water law, regional water law, and river treaties. It then discusses the legal codes prepared by legal scholars. Finally, it hints at some of the developments in water adjudications.

The current global water law includes customary international water law. Customary international law develops through a process in which States make a claim and other States put forth counterclaims until they reach an agreement (Danilenko 1993: 75–82; McDougal & Schlei 1955). Identifying customary law is a non-formalized and challenging process. Customary international water law now includes three principles. First, the principle of limited territorial sovereignty over national waters that limits the rights of states and requires them to consider the needs of other riparians (Dellapenna 2001). This principle emerged through a dialectic process where the claim of absolute territorial sovereignty (absolute control over national waters) competed with absolute integrity of state territory (absolute rights over waters flowing into a state from elsewhere, i.e., that waters flowing along or across national boundaries cannot be altered in terms of quantity and quality from what would naturally have occurred). Today, limited sovereignty is expressed as the principle of equitable utilization (ILA 1966, art. IV; ILA 2004, art. 12; UN 1997, art. 5), i.e., the need to share international waters according to principles of equity (fairness). The second principle is the no-harm principle that emerges from the Roman law maxim, *sic utero tuo ut alineium non laedes*—"Do not use your property so as to injure the property of another" (Dellapenna 2006, §49.05). The third principle is the obligation to settle disputes peacefully. Some states also claim historic rights, i.e., the right to use the quantity of water they have been using (Brunnée & Toope 2002). Such disputes arise especially between countries at different levels of development—e.g., Egypt and Ethiopia; South Africa and Mozambique (Dellapenna 1996).

The UN General Assembly approved the UN Watercourses Convention by a vote of 103-3 on May 21, 1997, nearly 30 years after the General Assembly requested the International Law Commission to prepare a codification of international water law. Although not yet in force (only 16 ratifications out of a minimum of 35 needed), it is seen as an authoritative, if conservative, reflection of existing customary water law (*Gabçikovo-Nagymaros Project Case:* ¶140). This convention adopts the principles of limited sovereignty (equitable utilization), no harm, and peaceful resolution of disputes by setting out a series of steps that countries need to take. It recognizes the right of all riparian states to engage in discussions around a shared watercourse to deal with existing situations where actions or agreements by or between some riparians have repercussions on others (*cf.* Salman & Uprety 2002). The convention was out-of-date when it was adopted as it scarcely referred to legal developments in the environmental, human rights, and investment arenas, but nevertheless it has influenced regional law in Southern Africa, South Asia, and Europe (Bangladesh-India 1996; UNECE 1999; SADC 2000; see van der Zaag; Farrajota; this book).

A major regional source of water law is the 1992 UN Economic Commission of Europe Convention on the Protection and Use of Transboundary Watercourses and

International Lakes (the "Helsinki Watercourses Convention"). The treaty focuses on transboundary surface and ground waters and obliges parties to prevent, control, and reduce transboundary impacts (art. 1(2)). It states that such waters should be "used with the aim of ecologically sound and rational water management, conservation of water resources and environmental protection". Reasonable and equitable utilization is encouraged and conservation and restoration of ecosystems promoted (art. 2). It includes the precautionary, polluter pays, and sustainability principles. It encourages the use of instruments such as licensing, best available technology, environment impact assessments, best environmental practices, and peaceful dispute resolution. In 1999, a Protocol on Water and Health was adopted to focus on improving ecosystem health and reducing water borne/related diseases from surface, ground, coastal, enclosed, and estuarine waters in the course of abstraction, transport, treatment, or supply. The Protocol includes the precautionary principle, polluter-pays principle, intergenerational equity, preventive principle, sovereignty subject to duties, subsidiarity, access to information and public participation, the concept of catchment areas, equitable access to water, and protection of vulnerable people principles (art. 5). The Protocol also aims to ensure access to drinking water for everyone and the provision of sanitation for everyone (art. 6).

There are hundreds of water basin agreements (Oregon State University 2002) including those in Southern Africa, the Jordan in the Middle East, the Great Lakes in North America, and the Rio de la Plata in Latin America, which are discussed in this book. These agreements increasingly show the development of administrative law where legislative and judicial functions are giving way to administrative rule making on a day-to-day basis by river basin commissions being set up for the purpose. Farrajota (this book) looks at some of the common features that emerge from these different legal regimes.

Water adjudication is a rich and old area with cases relating to water transfers between France and Spain (the Lake Lanoux case) and the no-harm principle in the *Trail Smelter Arbitration* (1938), along with several others. Castillo-Laborde (this book) surveys these international decisions in her chapter. Decisions regarding investments are covered by Dellapenna (this book).

Finally, legal professionals have performed a major role in shaping water law. The International Law Association, established in 1873 adopted the *Helsinki Rules on the Uses of International Rivers* in 1966 (ILA 1966). These non-binding rules presented the state-of-the-art of globally recognized legal principles in the 1960s and not only reflected state practice but also shaped state practice through the inherent legal logic of the ideas presented and the scientific authority of those legal scholars. Focusing on drainage basins including surface and groundwater, the rules aim to ensure "maximum utilization and development of any portion of its waters" (ILA 1966, art. II). The rules elaborated on equitable utilization that curtails the sovereignty of states with respect to fresh water. They also included rules on pollution, navigation, timber floating, and procedures for preventing and settling disputes. This document influenced the 1997 UN Watercourses Convention and regional agreements such as the Mekong Agreement (McCaffrey 2001).

In 2004, the ILA adopted its *Berlin Rules on Water Resources* to replace the *Helsinki Rules*. This non-binding document integrates the latest insights from environmental, humanitarian, human rights, and resource law. These comprehensive rules cover all national and international fresh waters and related resources (the aquatic environment) and thereby penetrate within national jurisdictions. The rules include the principles of public participation, the obligation to use best efforts to achieve both conjunctive and integrated management of waters, and the duties to achieve sustainability and the minimization of environmental harm. They identify the rights and duties of states and persons, the need for environmental impact assessments, and covers extreme situations including accidents, floods, and droughts. The *Berlin Rules* are grounded in existing law but also reflect the direction in which global water law is heading. It would perhaps not be out of place to mention that groundwater has traditionally been neglected by national and international water law and while the *Berlin Rules* (2004: ch. VIII) provide a good starting point, the UN Law Commission has adopted draft articles on transboundary aquifers, which is currently being reviewed by states (ILC 2006).

1.3.4 Inferences

The above section highlighted key developments in national law (the contextuality of laws, including the converging influences and pluralism in many parts of the world) and in supranational and international law (the debate on water ownership from classical, through feudal and Roman influences to modern water law, increasingly united in Europe under the European Union Directives). While these laws tend to become more complex, there are competing tendencies towards both integration and fragmentation (Kissling-Näf & Kuks 2004). At global level it is easier to talk of an internally consistent legal regime than of a policy regime. Common legal principles of water management are increasingly recognized and codified in professional works and treaties and referred to in judgements. While the current global water regime is far behind the times, the 1992 Helsinki Watercourses Convention, the 2000 EU Water Framework Directive, the 2000 Southern African Revised Protocol on Shared Watercourses, and the 2004 *Berlin Rules* together probably provide a comprehensive idea of how water law is developing.

1.4 An Overview of the Book

This book begins with a reflection on past historical approaches (see Part I); then moves on to discuss evolving national law and politics (see Part II), before assessing some aspects of evolving supranational and regional law and politics (see Part III); discusses some current trends in water governance (see Part IV); and closes by addressing some of the research questions put forward in this book (see Part V).

As an example of how law developed in ancient civilizations, this book looks at the evolution of water law and policy in ancient Mesopotamia. Itzchak Kornfeld presents a 5,000 year history of Mesopotamian water law and says that today's water law can learn from its non-confrontational dispute resolution system. He also notes that we seem to have made no progress in water allocation as still some 80% of water resources are used for irrigation.

In terms of religious law, developments in Islamic and Jewish law are discussed. Naff discusses the evolution of Islamic law over the last 2,000 years and shows how evolutionary Islamic precepts and modern western water law compete in shaping today's water law in Islamic countries. Many fundamental principles in Jewish water law are not particularly different from Islamic water law, reflecting their common origins. Richard Laster et al. show how in the Jewish tradition water was in general owned by the community and those living closer to it had more rights than those living further away. Water pollution was also taken very seriously and as time evolved, people took a more 'scientific' approach to the pollution challenge.

Part II presents nine chapters on national water law in different parts of the world. Paulo Jose Leite Farias discusses water law in Brazil, which has evolved from harmonious use patterns through rapid exploitation during colonial and post-colonial periods and has now moved to a sustainable use paradigm where river basin communities are entrusted to find the balance between human and ecosystem needs. Michael Kidd discusses the evolution of water law and policy in South Africa. He argues that the riparian system imported during the colonial period was not in sync with the actual water challenges pertaining to South Africa and resulted in reduced access to water for the majority of the black people during the apartheid era. Following democratic rule in 1994, the government has recognized the human right to water and the state as the trustee of the water. Its new policy attempts a gradual phase out of riparian rights and tries to phase in sustainable use, the human right to water, and recognition of ecosystem needs. David Nilsson and Ezekiel Nyangeri Nyanchaga focus on developments in the East African regimes and show through a comparative historical analysis how water law in Uganda, Tanzania, and Kenya has evolved over time. Richard Laster and Dan Livney focus on evolving Israeli water law and politics to reveal a complete break from the Jewish tradition of water law. Following the establishment of the state in 1948, water is seen as a national resource held in trust for the people, something curiously that the authors argue could never have been negotiated today. They explain the content of this comprehensive law in some detail. Viktor Kotov then introduces the history of water law in Imperial Russia, in the Soviet Union and in the Russian Federation after the end of the USSR. This explores the Communist/socialist approach to water law. Moving to Asia, Philippe Cullet and Joyeeta Gupta show how complex water governance is in the subcontinent of India. Several different historical influences still hold sway in different parts of the country and the current division of responsibility between states and the centre results in water policy taking different directions in different parts of the country. At the same time, grand ideas like linking all Indian rivers are being explored as a way of dealing with the challenges of water excess and water shortage. Moving to Australia, Jennifer McKay and Simon Marsden discuss

the evolution of water law and policy from the onset of colonial laws in 1788 and through a discussion of the relevant case law. They show how the colonial common law system began with the recognition of the notion of reasonable user of surface water and unlimited use of groundwater by riparians, through a system of competition between provinces and the centre over who could control the water, to a new system launched in 2007 of justiciable protocols where the centre makes laws in the national interest and gives effect to international treaties, and although the powers to make rules are concurrent, the provinces must comply with these rules. Returning to the USA, Joseph Dellapenna recounts the complex evolution of water allocation law, primarily at the state-level and Sandra Zellmer discusses water law in the USA in the context of emerging environmental issues, primarily federal law.

Part III presents five chapters focusing on different supranational and regional legal regimes. It begins with a discussion of the European Union regime, one that has evolved from loose coordination of the regulation of certain highly dangerous pollutants to the current system of comprehensive, basin-wide, eco-centric water management focusing on achieving a good status in all water bodies involving a wide variety of legal instruments. Next is a study of the evolving regional water governance in Southern Africa with Pieter van der Zaag exploring how customary beliefs were superimposed by eight agreements between the colonial masters about how the colonies should share their waters. Following tension on water sharing in the post-colonial period, the region is developing new institutions for the shared management of water, inspired by the 1997 UN Watercourses Convention. Then there is a discussion on the Jordan basin by Robbie Sabel. This politically stressed region faces chronic water shortage in the different riparian countries. Current plans treat the basin as an integrated whole but there is no agreement as of now. This is followed by an extensive overview of the developments in the North American Great Lakes by Noah Hall. This is a region of water surplus having 20% of the globe's fresh water. Although there is an international agreement on water management between Canada and the USA, most of the Great Lakes agreements are between the states and provinces which although not legally binding set the goals of how the riparians would like to promote the sustainable use of these waters. Finally, Griselda Capaldo discusses the Rio de la Plata Basin. Following a historical analysis of water policies, the author discusses the current international conflict surrounding pulp mills on the riverbanks.

Part IV looks at some current trends in water law. The judgements of court decisions are evaluated in an effort to understand the direction of the law. Lilian Del Castillo-Laborde discusses the precedents that emerge with respect to the general principles of watercourses law, water management, navigation and water boundaries. Maria Manuela Farrajota then tries to develop a theory of water cooperation by looking at how state practice in the area of water management gives the term both substantive and procedural content. Jona Razzaque goes on to explore how public participation has become a key feature of modern day governance including in the area of water law. Joseph Dellapenna then examines the role of water as an economic good and the role of markets and pricing in the governance of water. The book ends with an attempt by Joyeeta Gupta and Joseph Dellapenna

to bring all the different strands of discussion presented together in order to answer some of the key research questions put forward in the book.

1.5 Conclusion

Water cooperation has tended to foster the peaceful resolution of disputes as there are more cooperative events than disputes (UNWWDR 2003: 25). In fact, despite talk of "water wars," water resources tend not to be the key reason for conflict (Kalpakkian 2004). And yet, after 5,000 years of water governance history, there is still no mature system of water governance. A large number of challenges exist on a worldwide basis. Global water problems such as access, sanitation, unlimited access, pollution, climate change, ecosystem destruction, and changing flow regimes as a result of the cumulative effects of dams continue to face the global community. While the rich have addressed access issues, pollution, scarcity and flooding remain key challenges in many parts of the developed world. For the poor, the range of problems is much greater.

Governance systems themselves are in a state of flux. While there is a shift in the locations of governance, there is no corresponding shift in the rules of engagement to guarantee legality, legitimacy, accountability, transparency, and the rule of law. Will these multiple talking shops on governance lead to greater enlightenment or confusion in the process of water governance? Against this background noise, water law is slowly moving forward with more and more regional agreements, more administrative law frameworks, more joint water bodies at all levels of governance from community through to global levels. These legal systems, however slow they may be, have the authority of history behind them and may ultimately provide the vehicle for problem solving and conflict resolution in the twenty-first century. In the mean time, global governance will have to grapple with a number of issues – whether private participation of water will promote solutions to access issues; whether public participation is able to account for the common good; and whether non-state actors can more successfully govern political goods like water than state actors.

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Chapter 2
Mesopotamia: A History of Water and Law

Itzchak E. Kornfeld

Abstract Mesopotamia, the land between the Tigris and Euphrates, is home to the first civilizations in the Middle East. Dependent on the waters of the Tigris and Euphrates Rivers, Mesopotamian civilizations, including those led by Hammurabi, Dadusha, Nebuchadnezzar, developed a system of communal canals and irrigation works and a legal framework to govern these works. For all their legal developments Mesopotamians left a dearth of written water law. For example, of Hammurabi's 282 laws only four deal with water. However these laws established a regime for liability, they also aimed at restoring the injured party to his former position.

Keywords Arbitration • liability • mediation • Mesopotamia • water law

2.1 Introduction

Mesopotamia, the land between the Tigris and Euphrates (*Idiqlat* and *Indigna*, respectively in Akkadian), takes its name from two Greek words, *mesos* for 'middle' and *potamos* for 'river'. The term is commonly defined as the 'land between the rivers' (Dellapenna 1996: 214). Geographically, Mesopotamia is the land between the Zagros and Anti-Taurus mountains in the north and the Arabian plateau and Persian Gulf to the south, corresponding to modern Iraq, eastern Syria and south-eastern Turkey (Kjeilen 2006; Leick 2002: xiii). The region was the home to Sumer, the first civilization to appear in the Middle East (Wright 2005: 33).

This story begins approximately 6,000 years ago, when an enigmatic people emerged from the cloak of prehistoric anonymity, and began to build marvellous cities in the fertile plain between the mighty Tigris and Euphrates Rivers (For a time-line see Tables 2.1, 2.2 and 2.3). These Sumerian cities—Eridu, Ur, Lagash, Uruk, Shuruppak, Nippur, Kish, and Sippar were in Sumer, the land that in later days the Greeks would identify as southern Mesopotamia. Sumer gave birth to

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Table 2.1 Early Mesopotamian history

BCE	Description
9000	End of Ice Age; domesticated sheep in the North Tigris Valley; beginning the cultivation of wild wheat and barley and the domestication of dogs and sheep; shift from food gathering to food producing culture; Karim Shahir in Zagros foothills
7000	Pottery begins. At Jarmo, oldest known permanent settlement: crude mud houses, wheat grown from seed, herds of goats, sheep, and pigs
6000	Farming in Macedonia; pottery plentiful. Migration of northern farmers who settle in the region from Babylon to Persian Gulf. The Hassuna culture introduces irrigation, fine pottery, permanent dwellings; dominates culture for 1,000 years, develops trade from Persian Gulf to Mediterranean
Pre-Sumerians 5000–3500 BCE	
5000	Use of copper in Macedonia begins. The Ubaidians develop the first divisions of labour; mud brick villages; and first religious shrines. Small temple at Eridu—is the earliest example of an offering table and niche for cult object
4000	Semitic nomads from Syria and the Arabian peninsula invade southern Mesopotamia, intermingle with Ubaidian population. Temple at Tepe Gawra is built—setting the style for later construction

Table 2.2 The Sumerian period 3500–1900 BCE

BCE	Description
3500	Sumerians settle on banks of Euphrates; temple at Eridu—the ziggurat prototype
3300	Writing begins in Sumer; wheeled vehicles and wheel-made pottery, sailboats, and animal-drawn plows in Sumer
3000	Democratic assemblies give way to kingships, evolve into hereditary monarchies
2800	Akkadian conquest of Diyala region; introduction of pictographs to keep administrative records; 3-D statues, e.g., the Warka head; white Temple-ziggurat traditional design; temple at Tell Uqair with mosaic decorations; cuneiform land sales record; formal contracts; Eridu and Kish have simple palaces; the 'Standard of Ur', a war-peace plaque, religious statues, gold and silver artefacts buried in tombs of Ur; the Sumerians of Abu Salabikh record the first poetry
2700	Royal inscriptions appear in Sumer; Sumerian script used in Akkad; Sumerian fashions used in Mari; Gilgamesh, the hero of Sumerian legends, reigns as king of Erech
2500	Writing in Mari (a Sumerian script); keeping of daily accounts in Sumer; the pyramids completed in Egypt; Lugalannemudu of Abab unites city-states which vie for domination for 200 years
2400	Writing in Assyria (Sumerian script)
2350	Sargon I of Akkad, first known empire
2300	Copper common in Sumer; writing in the Indus valley (local script)
2250	The fall of the dynasty of Sargon; Ur-Nammu founds Ur's 3rd dynasty, dedicates ziggurat at Ur to moon-god Nanna, sets up early law code; Gudea, Prince of Lagsh, art and literature under royal patronage flourish, magnificent statues produced in his honour
2112	Gutian invasions
2100	Supremacy of Ur on lower Mesopotamia
2100	The laws of Ur-Nammu of Ur, the earliest preserved law book
2000	Elamites invade and destroy Ur

Table 2.3 Babylonians and Assyrians 1900–330 BCE

BCE	Description
1900	Amorites from the Syrian desert conquer Sumer
1800	Hammurabi ascends the throne in Babylon
1750	Hammurabi of Babylon rules most of Mesopotamia; financial transactions in Sumer and Akkad now commonly in silver
1600	Hittite invasion from modern Turkey ends Hammurabi's dynasty
1595	Hittites invade Babylonia
1500	Assyria conquered by Hurrians from Anatolia; bas-relief of baked brick appears as dominant art form; Karaindash Temple
1400	Kurigalzu assumes Babylonian throne
1200	Nebuchadnezzar I expels Elamites
1100	King Tiglath-Pileser I leads Assyria to new era of power; iron, introduced by the Hittites, is used extensively in Assyria for tools and weapons
1000	Assyrian empire shattered by Aramaean and Zagros tribes; Assyrian decline halted by Adadnirari II
900	Assurnasirpal II builds magnificent new capital, Calah, replacing old capital of Assur, present day Nimrud
800	Tiglath-Pileser II creates great empire extending from the Persian Gulf to the borders of Egypt; Sargon II builds new capitol at Dur-Sharrukin
700	Assurbanipal extends empire from Nile to Caucasus Mountains; Chaldeans and Iranian Medes overrun Assyria; Sennacherib's son, Esaraddon, rebuilds Babylon
600	Nebuchadnezzar II rules Neo-Babylonian empire; razes Jerusalem, takes the Jews into captivity in Babylon; builds his main temple, the Esagila, in honour of Marduk, whose ziggurat is the famous 'Tower of Babel'
500	Cyrus the Great, Persian warrior and statesman, conquers Babylon
334–323	Conquest of Persia by Alexander the Great; final fall of the Persians and Mesopotamian dominance over the region; beginning of Hellenistic period. Alexander the Great dies of fever

later civilizations, those of Babylon and Akkad. Dependent as they were on the Tigris and Euphrates Rivers, these Mesopotamian civilizations developed a system of communal canals and irrigation works. The resulting empires fashioned a legal system that fixed liability on persons who failed to safeguard and maintain their irrigation canals satisfactorily, thereby causing flood damage to others. Under this system, the general rule was that persons who failed to maintain their irrigation canals and thereby caused damage would have to compensate the damaged party and restore the *status quo ante*. Mediation and arbitration, by elders and others, were the rule. This chapter provides a road map, across a number of millennia, charting the Mesopotamian geography as it relates to water, the introduction of a legal regime into the area, and the development of water law within this legal framework.

2.1.1 The Geographic Setting

The Euphrates (Firat in Turkish and Furat in Arabic), the longer and for much of its length the larger of the two rivers that define Mesopotamia, arises in the Anatolian

mountains of what is now eastern Turkey, flows south-west and then turns south-east to flow across the north-west of modern Syria and then down the length of modern Iraq. At 2,700 km (1,675 miles), it is the longest river in south-western Asia and the second longest in the region stretching from Morocco to Iran. Despite its length, however, the Euphrates is a smallish river, with a normal annual flow, as measured at Hit in Iraq, of around 32 billion cubic metres ('BCM'), ranging between 10 BCM and 40 BCM depending on variations in precipitation upstream, a bit less than half of the current average flow of the Nile and less than one third of the average flow of the Nile in former centuries (Kliot 1994: 22). Furthermore, as with most rivers in the Middle East, the Euphrates is 'exotic'—i.e., it arises in well-watered mountains and flows across an extensive dry area before reaching the sea, and naturally becomes smaller as it approaches the sea (Kliot 1994: 105–08). Its largest (and last significant) tributary, the Khabur River, joins the Euphrates shortly after it enters modern Syria (Kliot 1994: 100–09).

The Tigris also arises in the Anatolian mountains (only 30 km from one of the sources of the Euphrates) and flows south into modern Iraq after forming part of the border of modern Syria with Turkey and Iraq. The Tigris is one third shorter than the Euphrates, measuring only about 1,840 km (1,140 miles). It also has a smaller flow until well into modern Iraq, averaging a flow 23 BCM as measured at Mosul in northern Iraq. The Tigris, flowing further to the east and close to the Zagros mountains (the modern border between Iran and Iraq), receives major tributaries along its entire length, including several tributaries from the Zagros region. One of those tributaries, the Greater Zab, contributes as much as 13 BCM annually, and the tributaries reaching the Tigris in Iraq collectively contribute an average of around 30 BCM/year. Thus, although the Tigris also experiences the major evapotranspiration and seepage losses characteristic of this dry, desert region, it is not an exotic river, maintaining and even enlarging its flow as it approaches the sea. The Tigris measures about 49 BCM/year at its terminus in the Shatt al-'Arab, although this flow, like that of the Euphrates, varies considerably from year to year (Kliot 1994: 100–04, 110).

Early in their history, the two rivers reached the Gulf separately. The growth of their deltas eventually led to their merger into the Shatt al-'Arab. Historically, the Shatt was really a vast swampland, the home of the Ma'dan (the 'Marsh Arabs'). The inflow averages about 66 BCM (a bit less than the average flow of the Nile, three quarters from the Tigris), but an outflow into the Gulf of only 20 BCM (Kliot 1994: 110).

Mesopotamia was the birthplace of writing, law, and the wheel (Kliot 1994: 116–17). It encompasses the Fertile Crescent (Leick 2002), the region that first produced barley, wheat, sheep and goats (Wright 2005). Mesopotamia is also the region where the first city-states were formed in the Middle East. The alluvial plain of the Tigris and Euphrates Rivers south of modern-day Baghdad was known in the third millennium as the land of Sumer and Akkad. Sumer was located in the southernmost part of Iraq, 50 miles south of modern Baghdad to the area of today's Basra, and may have stretched as far south as um Qasar to the marshes populated by the shi'a Marsh Arabs of today. Akkad was located near modern Baghdad, directly on the Tigris,

and stretched to Ar Ramådi on the Euphrates. This region is where the two rivers flow closest to each other. In later centuries, both regions were called Babylonia. To the north, tucked up against the Anatolian Plateau near the Great Zab River and along the Tigris and Euphrates, lay Assyria, with its capital Assur, also spelled Ashur, from Assyrian Aššur (Kornfeld 2004: 10635).

2.1.2 The Development of Mesopotamian Riparian Life

Table 2.1 presents a brief history of early Mesopotamia. At the dawn of civilization, humans knew that water is life itself: it quenches thirst, provides abundant food, and enables easy transportation. Humans have from time immemorial congregated around rivers. The modern world's greatest cities are situated on the banks of rivers. Humans want social rather than solitary lifestyles, a need rooted in their basic needs and drives, traceable to their primate ancestors. Their social existence, manifested in durable, preservable structures, such as houses and temples for deities, is observable back into the Middle Eastern Stone Age.

The earliest gatherings of people, along the Tigris and Euphrates Rivers were, therefore, attempts at forming an ordered and cooperative society promoting the security and common well-being of its members (Wright 2000: iii). As with other social creatures, certain settings became favoured meeting places, because they offered material benefits, e.g., water, food, shade, etc. Riparian environments provided such settings. Nevertheless, the two rivers 'could also be an extremely threatening environment … driving [Mesopotamians] to seek security from the [massive annual floods and the other] vicissitudes of nature' (Metz 2004: 1). These gathering locales may have been perceived to possess numinous qualities with links to a furtive godly world where the power to vanquish and subdue the chaos of man's life resided, a power that might somehow be persuaded or enticed to act in man's behalf, e.g., the Babylonian gods. Marshes, burial grounds adjacent to rivers, point bars, and certain distinct plants seemed to be a part of this mystical world (Mumford 1961).

When the first villages emerged, their setting was governed by their nearness to sacred shrines and material considerations such as fertile land, dependable water supply, defensible position, and later, proximity to trade routes. Thus, finding a dwelling place and collectively assembling structures to form a village was man's initial attempt at controlling his environment (Leveson 1980). It was also an effort to imbue sacredness in the chosen space blessed by God. The Abrahamic story in *Genesis* is but one such episode: 'Now the Lord said unto Abram: "Get thee out of thy country, and from thy kindred, and from thy father's house, unto the land that I will show thee" … and they went forth to go into the land of Canaan' (*Genesis* 12:1, 12:5).

Most day-to-day activities centred about a regimen that over time became established custom. Successful customs were clung to, while others were cast aside, and no deviation from the established order was tolerated. Morality was believed to stem from actions or behaviour that allowed people to live harmoniously in an

unforgiving world; everything else was considered immoral, and the perpetrator of immoral acts was punished or expelled. Over time codified law developed from the customs of each society. Similarly, in the Middle East's arid climate, the law of water use—a subset of the entire body of law—developed according to custom.

2.2 The History of Mesopotamian Water Development

Geology and geomorphology govern the location of water bodies. Before 10000 BCE, a glacial ice sheet covered much of the northern hemisphere, including the area north of the Arabian Sea (University of California 1995). By 6500 BCE, the ice sheet had receded from Europe and the Middle East, and the climate warmed into the one we are familiar with today (Dellapenna 1996: 214). In Mesopotamia, an economy based on cultivating grain thrived and agriculture became the basis of civilization, allowing development of humans and the growth of villages (Leick 2002: xiii). By 3000 BCE, the Sumerians had established a mature civilization, with thriving urban centres (Leveson 1980: 13; See Table 2.2 for a history of the Sumerian period).

Professor David Leveson suggests '[t]hat the rise of civilization and cities took place in the Middle East was not accident' (Leveson 1980: 13–14). He notes that '[a]griculture dependent upon rainfall is hazardous, except in those places where rainfall is seasonal, predictable and dependable'. In Mesopotamia and the rest of the Middle East, rainfall 'is erratic, and successful large-scale farming awaited the spread of agriculture to the irrigable valleys of the lower Tigris and Euphrates rivers, and the development of the technical skills necessary to conceive of and implement the building of dikes and canals to divert and transport water to crop-growing areas'.

Professor Leveson's observations address the southern plains, between modern-day Baghdad and the Shaat-al-Arab, as well as the Persian Gulf. It is 'essentially a vast flood plain, the land having been formed by huge deposits of silt carried down by the rivers' (Leick 2002: xiii). Here the Sumerians settled and built the cities of Eridu, Kish, Lagash, Nippur, Ur, Uruk and Susa. The alluvial soils that the flood-waters of the Tigris and Euphrates dumped here were not homogeneous, containing varied minerals, unlike the fertile soils in the north—the land of the Akkadians and Assyrians. Although the southern plains were flat and potentially fertile they received little rain. Thus, these soils lay fallow until the Sumerians learned 'to adapt to this environment, significantly through control of the waterways by means of canals and dykes, [when] it became possible to capitalize on the inherent economic potential of the southern plains' (Leick 2002: xiv). With this, 'the first large-scale communities began to develop' and people progressed beyond subsistence farming to produce a surplus, 'diversify their cultural activities and live in increasingly large numbers in a new form of collective community, the city' (Leick 2002: xiv). Humans domesticated a limited number of grains and animals and began on a

monocultural diet, a path that continues to this very day. Table 2.3 sums up the history of the Babylonians and the Sumerians.

2.3 Mesopotamian Law: An Introduction

Perhaps the greatest legacy of the Mesopotamian civilization is 'law', mostly originating in the southern region (Veenhof 1995). A century ago, archaeologists unearthed the now famous stele (engraved or painted pillar or slab) of the Laws of Hammurabi, the first of many others that would be found. However, the first written laws of the peoples that lived between the Tigris and Euphrates had occurred even earlier, about 5000 BCE. These 'statutes' were recorded to establish legal authority and order. The formal development and transcribing of law or codes occurred between 3000 and 1600 BCE—corresponding respectively to the dawn and the eclipse of Mesopotamian civilization. This period witnessed 'the first development of law in human history (VerSteeg 2000: xiii).

2.3.1 The Early Codes

The earliest written codes were inscribed in cuneiform characters (Veenhof 1995: 1717). The oldest codes, inscribed in the Sumerian language, date back to at least 2000 BCE; others, written in Sumerian or Babylonian, date to the first centuries of the second millennium BCE. '[T]he "law" and the "law collections" throughout Mesopotamia, considering the variety of social, linguistic, political, economic, and ethnic changes over three millennia, contain a rich multitude of layers of meaning. Although there are shared traditions, there is no single "common law" throughout the ancient Near East … There is no uniform "law" of any specific legal category….' (Roth 1995a: 13).

Our current knowledge of Mesopotamian law and culture is restricted to the archaeological record, which comes predominantly from the southern portion of modern day Iraq (Veenhof 1995). Hammurabi's and other early codes were found on 'stele'—'inscribed monuments used for display or "publication" of official inscriptions such as laws.' The 'law' was also reflected in judicial records, contracts, letters, and other legal documents. These documents were preserved by enclosure in sealed clay 'envelopes' to safeguard the manuscript from the possibility of damage or from unauthorized alterations made (Roth 1995b: 71). The bulk of the text was completely reproduced or replicated on the exterior of its clay husk. If later, one was required to read the complete text, the enveloping sheath had to be shattered. Scores of documents and letters have been found, still encased in their clay envelopes (Roth 1995b). Some texts were unearthed far from where they were written. For example, Hammurabi's Code, was unearthed in Susa, Iran, and is believed by

archaeologists to have been transported there from its original location in modern Iraq (Veenhof 1995: 1719–20).

Mesopotamian culture did not have a term for 'law'. Rather, the terms *Sum*, *Di or Akk. Dinu* 'designated the legal case, the legal decision itself' (von Soden 1985: 131). The term *Dinu* appears to be an antecedent to the Hebrew word '*Din*' (plural '*Dinim*'), which means judgment or law (Sivan & Levenston 1975: 38). Justice (referred to as '*Ni-si-sá = misaru')* was viewed as the supreme virtue. Law and justice were watched over and protected by the pantheon of gods, of which the sun-god Utu/Shamash was pre-eminent in this regard. The law itself was rooted in the spiritual and the sacred. On earth the king was charged by the gods with upholding the law. Thus, he was both the lawgiver and the 'court' of last resort.

The archaeological record is unclear as to whether all legal precepts were decreed by a monarch at the beginning of the Mesopotamian civilization, circa 6000 BCE. Nevertheless, legal regimes and edicts existed for thousands of years before the initial law codes were executed and disseminated, circa 2500 BCE. Although these compilations of laws are referred to as codes, they are not of the same calibre of the Code of Justinian or the Code Napoleon. Even Hammurabi's Code addresses a small subset of legal issues, a restructured version of laws that were extant and probably appended to long established legal cases. Furthermore, none of the legal collections are systematically ordered. The various types of laws, whether civil, penal, trade, or other, alternate with one another (von Soden 1985: 131).

Although the early laws, including Hammurabi's Code, were preceded by a preamble, few of these introductions are preserved. The most prominent surviving prefaces are within the laws of Eshnunna and Hammurabi's code. In more recent times, the Babylonians designated decrees of legal proposals to change prior laws *mlsaram sakiinum*. New kings employed these promulgations to introduce their reigns. These proclamations were almost always accompanied by a holiday reducing the amount of work that their subjects would have to perform. Documents and correspondence beginning approximately 1900 BCE are frequently filled with or refer to *simdatum* (meaning discrete case decisions). In later periods, believed to begin circa 1100 BCE, the term is no longer employed (von Soden 1985).

2.3.2 Legal Edicts: Hammurabi's Code and the Laws of Eshuna

Hammurabi, sixth ruler of the First Dynasty of Babylon, reigned from 1792 to 1750 BCE (Roth 1995b). His Code, written towards the close of his reign, transcends all of the other Mesopotamian codes in length and organization. Its prologue stresses the gods' approval and appointment of Hammurabi as his people's ruler and the guardian of the law. The stela containing these laws is composed of a single piece of diorite, which measures over 2.4 m (8 ft) tall. Its face contains seven chiselled columns, upon which Hammurabi's Code was carved. The Code's 282 numbered

paragraphs are not ordered. The Code includes a new article regarding the high expectations from judicial behaviour. They were required to summon witnesses before a suspect was convicted of a crime. Accordingly, this expectation held that '[i]f a judge try a case, reach a decision, and present his judgment in writing; if later error shall appear in his decision, and it be through his own fault, then he shall pay twelve times the fine set by him in the case, and he shall be publicly removed from the judge's bench, and never again shall he sit there to render judgment' (King 1910: ¶5). Finally, Hammurabi himself or a governor could be invoked as the highest appellate court. Documentation demonstrates that this writ was not uncommon.

Dadusha of Eshnunna published a corpus of law in 1735 BCE in 60 paragraphs (von Soden 1985). This stela commences by establishing tariffs, and then moves on to matters affecting ships, grain, family, slaves, physical wounds, animals, and the construction of houses, all without any strict order. As with earlier codes, it does not mention who is to adjudicate disputes, although the palace is referred to once as the court of judgment. These laws are quite similar to the Sumerian code and Hammurabi's code.

2.3.3 Judges and the Judiciary

'Arbitrators' and 'judges' emerge as *bona fide* professionals early on within the Early Dynastic era. This system of dispute settlement apparently took hold in Ebla and in Lagash (von Soden 1985). In later texts, the judge or arbitrator appears with increasing regularity as a member of the governing elite. The human judge, however, was part of a pantheon of legal arbiters, which included the sun god as well as a special 'Judge God' ('Madanu'). One assumes that future judges were apprenticed to existing judges, akin to an internship. Since statutory law was limited, a judge had to employ his own discretion in reaching a decision, as in the non-Mesopotamian example of King Solomon and the dispute over a baby. Previous decisions in matters addressing similar problems, within the particular district, canton, or city, may have also guided judges. Thus, there may have been a tradition or custom of following precedents handed down by learned or well-respected colleagues, that is, a type of *stare decisis*. This chapter now turns to the substantive law of water.

2.4 Mesopotamian Water Laws

Water law in Mesopotamia developed as a consequence of the allocation of rights to a limited resource. The bundle of allocation rights is 'no doubt as old as irrigation-agriculture itself. Where claims between communities were involved [dispute] settlement was more difficult since the authorities in a position to solve such a controversy were more distant and remote' (Hirsch 1959:168–69).

Based on the various codes it appears that water was a communal asset, especially as local authorities, acting in their own behalf or on behalf of regional governors, would grant rights to communal water supply and act quickly to alleviate any irrigation or other usage issues. Irrigation was only possible because of dams, sluices, canals and other water diversion structures. These and even the river itself were a communal rather than an individual asset. Some structures were so large that one individual would be incapable of taking care of them, 'even if he had a proprietary right to them' (Hirsch 1959:169).

In large areas of Mesopotamia, therefore, the practice was to appoint a local official, who was fully familiar with the area, the facts on the ground, and earlier precedents, and who would tend to irrigation and other water conflicts or affairs on an immediate basis. Consequently, in any given water dispute between two members of the community, this communal representative was responsible for arbitrating or mediating the individual claims. Additionally, 'the intensive farmers of the ancient Near East were mainly tenants of public (state and temple) lands or of private estates' (Wittfogel 1956: 154). '[W]here this was true, the manager of the farming complex was in a position to decide the outcome of any water rights contest' (Hirsch 1959: 169). The Mesopotamian archaeological record, however, provides little information on water law. This section addresses water provisions or jurisprudence that we have in Mesopotamia from 3500 to 100 BCE.

2.4.1 The Laws of Ur-Numma

The Ur-Namma Codes had a prologue, where the king (probably Ur-Namma of Ur, 2112–2095 BCE, or his son Shulgi, 2094–2047 BCE) identifies himself and routinely states that he is provided with the power to make laws because he is an offspring of a god or gods, or is given that power by a deity, e.g., Shamash, the sun god. Thus, laws were divinely inspired (Roth 1995b: 15). The Ur-Numma prologue recounts the king's accomplishments, including affording his merchants with protection for peaceful land and sea commerce, which allowed trade to flourish, as well as establishing uniform standards for 'weights and measures' (Roth 1995b: 14). Of the 37 laws and the partial prologue preserved today, only one addresses water law: ¶31 of this stele states that '[i]f a man floods (/) another man's field he shall measure and deliver 720 silas of grain per 100 sars of field' (Roth 1995b: 14).

2.4.2 Hammurabi's Code

Hammurabi's Code addresses only four (¶¶53–56) of its 282 paragraphs, or 1.42% of the total, to water regulation. Paragraph 53 states: '[i]f any one be too lazy to keep his dam in proper condition, and does not so keep it; if then the dam break and all the fields be flooded, then shall he in whose dam the break occurred be

sold for money, and the money shall replace the corn which he has caused to be ruined'. Paragraph 54 maintains: '[i]f he be not able to replace the corn, then he and his possessions shall be divided among the farmers whose corn he has flooded'. Paragraph 55 states: '[i]f any one open his ditches to water his crop, but is careless, and the water flood the field of his neighbour, then he shall pay his neighbour corn for his loss'. Finally, Paragraph 56 provides: '[i]f a man let in the water, and the water overflow the plantation of his neighbour, he shall pay 10 gur of corn for every ten gan of land' (King 1910: 6–7).

2.4.3 The Sumerian Laws Handbook of Forms

This four-sided prism, circa 1700 BCE, measures 19.5 cm (7¾ in.) in height, with three columns on each face. It comprises a 'Sumerian compendium of contracts and contractual clauses, legal provisions comparable to those found in the law collections, and isolated phrases such as might be found in Old Babylonian contracts' (Roth 1995b: 46). One paragraph reflects the spirit and character of the law (iv 34–41). If a man diverts water into a field that an amna has harrowed and floods the field, he shall replace the grain according to (the yields of the fields of) his neighbours' (Roth 1995b: 51).

2.4.4 The Hittite Laws

Hittite law, known as the '*aa*', prohibits: 'robbing [of] a downstream ['s] neighbour entirely of the canal's water' (Hoffner 1997: 212). A lesser offence 'would be merely taking some of the water downstream without affecting the upstream neighbor in the least …' (Hoffner 1997: 212); or as per paragraph 162, a fine of one shekel of silver is levied on one who diverts a watering ditch (Neufeld 1951: 178). Hoffner suggests that a middle case may well have been where the upstream riparian would have taken some of the upstream water, and reduced the flow to the downstream riparian only slightly.

2.4.5 The Middle Assyrian Laws

Assyria, the kingdom located north of present day Baghdad, became the dominant and unrivalled power in Mesopotamia during the reign of Tiglath-Pileser I (1114–1076 BCE) (Roth 1995b: 153). The Middle Assyrian Laws are preserved in 15 distinct 'tablets' (A through O). They appear to originate from a single source or venue, except for A, which has a later fragmentary replica, and a set of duplicates of certain paragraphs in B and O (Roth 1995b: 153). Two incomplete provisions

dealing with water are found in the tablet marked as J and one in tablet O. Tablet J has a break of undefined size above the written section.

The two J laws, J ¶2 and J ¶3, provide the following respectively: '[if …] he shall irrigate, […] he shall irrigate'; and [If…] three (?) men one man […] of the city … […] there is not […] when the (irrigation canal?) is blocked (?) […] they have performed, they shall make restitution (Roth 1995b: 187). The partially recovered regulation found in tablet O provides in ¶4 that: 'If the owner of […] their water […] they claim and they give […]' (Roth 1995b: 191). Since these provisions are very fragmentary, an expert will need to fill the gaps before their legal meaning can be obtained.

2.4.6 Neo-Babylonian Water Law

The Neo-Babylonian or Chaldean dynasty (625–539 BCE) was the political and military successor of the Assyrian dynasty (Roth 1995b). During the reigns of its first two kings, Nabopolassar and Nebuchadnezzar, there were deliberate efforts to emulate Hammurabi's development of society. Although Hammurabi's dynasty was more than a millennium old during the Chaldean period, these kings sought to reproduce the greatness of their predecessor's social reforms and their legal regime and literature, among other enterprises (Roth 1995b: 143). The Neo-Babylonian/Chaldean laws are preserved only through 15 law provisions. Paragraph 3 of these laws provides that where a man opens his well to an irrigation conduit but fails to buttress this outlet and due to the failure triggers a breach, which causes his neighbour's field to flood, his damages to his injured neighbour will be payment of grain in an amount relative to his neighbour's yield (Roth 1995b: 145). This provision is almost a verbatim reproduction of ¶55 of Hammurabi's Code as well as the language in the Sumerian Laws Handbook of Forms.

2.4.7 Liability Concerning Irrigation

Although the codification of irrigation laws has not survived, given its importance to life there must have been such laws. As VerSteeg notes, 'In Babylonia rain falls only in the winter—none from June to August.… Consequently, although the rain is of value in the ploughing season, the farmer in fact require[d] some form of irrigation for date palms, cereal crops and vegetables' (VerSteeg 2000: 135–36). Thus, unlike the Nile River basin, Babylonia's, and indeed Mesopotamia's, farmers have, from time immemorial, depended on irrigation to grow their crops. The need for year-round irrigation was no doubt the catalyst for the Sumerians early development of elaborate irrigation systems along the Tigris and Euphrates Rivers.

The laws of Hammurabi, the Assyrians, and the Chaldeans were careful to impose legal responsibility upon persons who failed to safeguard and maintain irrigation

canals satisfactorily, thereby causing flood damage to others. The failure to maintain an embankment would have had catastrophic consequences. '[A] moment's carelessness may result not only in leaving crops and cattle dry and parched in one part but also wide-spread floods in another part of the district' (VerSteeg 2000: 136). The general rule was that the remedy for damage caused by a party who failed to maintain his irrigation canals was compensatory in nature, restoring the damaged party to the *status quo ante*. See, e.g., ¶3, 'they have performed, they shall make restitution'; and ¶3 of the Neo-Babylonian laws, '[A man who opens] his well to the irrigation outlet but does not reinforce it, and who thus causes a breach thereby [floods] his neighbour's field, shall give grain in accordance with the [yields of his] neighbour [to the owner of the field]' (Roth 1995b: 145). Note that this remedy did not seek to punish the negligent owner, it only sought to put the injured party in the position he would have been in had the damage not occurred. In fact, it appears that the law's aim was not to make the damaged party whole. That is, the negligent party was not required to compensate the damaged party for injury to his field or the costs of replacing or repairing any structures.

In contrast, the law was quite harsh when the negligent party failed to compensate the injured party. That is, default was not tolerated. Paragraph 54 of Hammurabi's Code provides: 'if he be not able to replace the corn, then *he and his possessions* shall be divided among the farmers whose corn he has flooded.' Thus, the defendant could be sold into slavery to satisfy the 'judgement'. Moreover, the remedy for damage to property lies in strict liability. One could not bargain about the value of crops. Once the extent of the injury was proved the negligent party was obliged to pay. Similarly, ¶31 of the laws from the Ur-Nammu dynasty state that '[i]f a man floods (/) another man's field he shall measure and deliver 720 silas of grain per 100 sars of field' (Ellickson & Thorland 1995: 349 n. 153).

2.5 Was Water Law Part of Mesopotamian Customary Law?

The paucity of water law in Mesopotamian culture, e.g., 4 paragraphs out of 282 of Hammurabi's complete stele, is typical of law in the Middle East. The Bible, with all its laws, has no water jurisprudence (Hirsch 1959: 170). This implies that water was governed by customary law especially because 'Babylonia's climate and topography destined it to become a quintessential "hydraulic society" …' (Ellickson & Thorland 1995: 87). Furthermore, the historical record is abundant with evidence that by 4000 BCE, the region's peoples understood that in order to irrigate their crops, they had to control the Euphrates River, so that they could convert the hostile and bleak desert floodplain into cropland (Leveson 1980: 13–14).

Over centuries, the inhabitants of southern Mesopotamia had to contend with spring floodwaters, when water levels in the river exceeded the riparian lands, and summer droughts. Annual skirmishes between man and river led the latter to develop tools and methods, 'includ[ing] outlets cut in sides of the natural river

levees to feed canals; excavated canals (perhaps opportunistically congruent with abandoned meander channels); regulators (weirs) employed to keep canal waters above adjoining land surfaces; and localized canal outlets to allow for controlled inundation of fields' (Ellickson & Thorland 1995: 329–30). The construction of these structures required social institutions and concomitantly, legal institutions.

Benvenisti (2004: 617) has noted that: '[r]eliance on collective management of shared freshwater was central for human subsistence that the collective effort to manage water became the bond that gave birth to many societies. Communities in arid and semi-arid areas [such as Mesopotamia] had to coordinate activities to procure sufficient water to feed their families and cattle and to irrigate their fields … This endogenous cooperation resulted in efficient utilization of the communal resources.' Consequently, a rich legal system, which grew out of an urbane and highly developed social and political system, was necessary to produce and maintain elaborate and complex irrigation works. In addition, a well-developed water regulatory system protected both a collective or individual ownership of the resources.

These realities, and the dearth of any *hard* law, also points to these societies' inclination towards customary law. A well-known example of customary law is the Biblical tale of Jacob's encounter with Rachel. Rachel had come to a well to water her father's sheep. A heavy stone, however, had been placed on the well—a community or collective asset—that served all of the villagers' herds. Jacob, demonstrating great strength, was able to remove the stone, which under different circumstances would have required the efforts of a number of the villagers (*Genesis*, 29: 1–11). Covering the well with a stone was a customary legal method for granting access to a well's waters and for protecting this common resource. It was a device employed as a resource allocation tool and allowed collective timing and quantity of use as well as the collective monitoring of the asset. Furthermore, the stone allowed the community to assign responsibility for overdrawing and potential contamination of the well.

Another example, developed in Persia in the ninth or eighth century BCE, is still in use today. The use of *qanats* involves a communal spring or spring system, wherein villagers dig tunnels into rock substrate to drain the saturated aquifer more efficiently, while increasing the spring's flow and distributing its waters. Moreover, these *qanats* were and to this day are used for crop irrigation in Persia and Syria, with tunnel lengths as long as 50 km. This apparatus was developed by local people and 'emerged without the backing of a central government [but] developed through local customs in the ancient Persian kingdoms' (Benvenisti 2004: 618).

Finally, the 'clay trail' of legal documents of rulers from diverse regimes and geographies across a number of centuries shares a number of themes and rules. Ellickson and Thorland (1995: 331–32) observe that some of these parallels indicate robust 'commonalities in the customary law of Babylonia.…' Whether Babylonian jurists in fact observed these regulations is a subject of spirited dispute. Nevertheless, there is no disagreement about the fact that these documents are an indispensable basis regarding the customary behaviour of the legal organizations of that age (Ellickson & Thorland 1995: 332).

2.6 Conclusion

This chapter attempts to provide a road map, across some five millennia, charting the development of water and irrigation law in Mesopotamia. To begin with, approximately 6,000 years ago, an unknown group of people appeared from the obscurity and began to build spectacular cities in the fertile plain between the Tigris and Euphrates rivers (a region roughly equivalent to modern Iraq). These cities—Eridu, Ur, Lagash, Uruk, Shuruppak, Nippur, Kish and Sippar—were the cities of the Sumerians, and the entire region was known as Sumer, or in later days by the Greek name Mesopotamia. Sumer was followed by later civilizations, those of Akkad, Babylon, Assyria, and the Chaldeans (Neo-Babylonians).

Mesopotamian civilizations developed a system of communal canals and irrigation works and a customary legal system that imposed liability upon those persons who failed to satisfactorily safeguard and maintain the irrigation canals, thereby causing flood damage to others. Under this communal system, the general rule was that damage caused by the party who failed to maintain his irrigation canals was compensatory in nature, so that the damaged party would be restored to the *status quo ante*. Mediation and arbitration were the rule.

There are two lesson that today's world can take away from Mesopotamian culture. First, is its design of a sustainable network of communal irrigation canals that lasted thousands of years. But concomitantly that culture's over-irrigation of its soils, led to their salination and the ultimate fall of Mesopotamian civilization (Leveson 1980). Second, is the prevalence of the resolution of the majority of disputes using a customary set of rules, in a non-confrontational system. Given the paucity of *hard* water law, one is led to surmise that proceedings before a court or a judge was a rare occurrence, and in any case a matter of ultimate resort.

Unlike Mesopotamia, the developed world is profligate in its use of water. Nowhere, is this truer than in the American West, where cotton and rice are grown in, California's deserts, for example in the Imperial and Coachella valleys. Furthermore, no ground has been gained in how societies apportion water: today as was true five millennia ago, 80% of our water is dedicated to irrigation (Sax et al. 2006: 6). Finally, *homo modernus* is held captive by a series of untenable and complex legal regimes that enmesh him in a regulatory spider web, from which it appears there is no breaking through.

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Chapter 3
Islamic Law and the Politics of Water

Thomas Naff

Abstract This chapter analyzes the legal, political, and social dimensions of water in Islamic law (*sharia*), incorporating some comparisons with Western and international law. The issues considered include the law and the political challenges of water, the fundamentals of *sharia* and water, the centrality of custom (‘*urf*) to that relationship, the development of modern secular water codes in Muslim nations and their connection with *sharia*, reforms in the modern epoch, the ascendancy of Western law and its consequences, the continued relevance of *sharia* to water, and conclusions.

Keywords Custom (‘*urf*) • hadith (traditions of the Prophet) • international law • jurisprudence (*fiqh*) • *qadi* (*judge*) • Quran • *sharia* • schools of law (*madhahib*) • *sunna* (actions of the Prophet) • *umma* (Muslim community)

3.1 Introduction: Water, Society and Law

Water links us to all facets of our existence. This axiom encompasses the seamless wonders and complexities of water and is the fundamental determinant of the law and politics of water. Water is a unique and peculiar substance for which there are no substitutes in human use, making it utterly vital. Water is a fundamental determinant of where, in what numbers, and under what conditions human societies live. It is maldistributed, scarce, and pervasive as a problem, and in many ways eccentric in its physical and chemical nature. Water flowing in its natural state, recognizes no political or other human boundaries. Under conditions of scarcity, water becomes a highly symbolic, contagious, aggregated, intense, salient, complicated, power-packed crisis issue, highly prone to conflict and often extremely difficult to resolve. Therefore, water has become an issue of international borders and sovereignty as

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well as a source of disputes between and among neighbouring communities and individuals. Often, in a given basin whose waters must be shared, long distances separate the first and last users, involving separate domains and communities whose inhabitants have languages, cultures, institutions, laws, policies and attitudes towards water that are at variance with one another. These basic characteristics make water an incomparable political issue.

As human societies evolved, rules were formulated for the ownership and use of the natural resources essential to the survival and progress of the community. These rules—whether divinely inspired, secular, customary, or codified–tended, by and large, to be developed and applied to each resource separately as the resource was needed and exploited. Primary among them were land and water that were initially treated as inextricably combined. The regulations were, eventually, split into two broad categories, public and private—though under Islamic canons, they were treated somewhat differently than in Western law. Unlike land laws, the legal treatment of water was not comprehensive. Rather, particular uses of water—dictated by need—were separately regulated, e.g., irrigation, domestic use, navigation, etc.

Each water system, including its drainage area, is unique in its hydrogeology, and, often, in its environment and ecology. There is a strong tendency in the international arena to treat water-related problems in piecemeal and fragmentary ways. Virtually every water dispute is, accordingly, plaited with many strands of political, social, economic, demographic, hydrological, and culturally symbolic components all of which are ideologically stamped. Thus, the settlement of hydro-political disputes is essentially a negotiation of linkages. These characteristics of water issues typically generate the difficulties that attach to hydro-political quarrels and make their settlement knotty and the outcomes consequential.

The unparalleled demographic burgeoning of humans over the 2 last centuries, simultaneously with phenomenal permutations of modern science and technology that produced worldwide growth in water demand, have created extraordinary demands on the earth's water and other natural resources, demands intensified by global warming. Demand for water has grown exponentially in most regions of the world—by 2030, almost half the world's population will live in water-stressed lands—but in no region more than the Islamic Middle East that constitutes a veritable template of the world's water problems. Owing to these developments, the law and politics relating to the world's water resources will be put to new tests.

3.2 The Islamic Law of Water Resources

The multifaceted lineaments of water establish both the essential need and the inherent limitations of law, whether secular or religious, in settling and regulating water disputes. The cornerstone of freshwater law is the assumption that the allocation of scarce resources requires legal means, rather than force, if sharing is to be equitable and conflict is to be avoided. When sovereign nations or persons share an international watercourse–particularly if the water supply is scarce—the role of law is to delineate the rights and responsibilities of those involved and to provide the means

for long-term cooperation in the fair and reasonable use of the water. This rather simple postulate masks an underlying, more intricate function of riparian law: It provides a conceptual and institutional framework for carrying out agreed-upon rules for resolving disputes rationally, peacefully, and equitably and it is the best alternative to settling conflicts on a basis other than sheer power and violence.

Law then is, generally, a shaping variable in human affairs. All water-related problems are inherently political, requiring a political process for solution. Therefore, in all circumstances, water law can be efficacious only when water users, whatever their culture or juridical systems, commit to law as the first recourse for the delineation and regulation of rights and responsibilities, and the amelioration of grievance–particularly in the absence of trust among the actors involved. While law cannot provide all the answers to water disputes, law is, nevertheless, indispensable to finding, maintaining, and legitimizing any negotiated settlements. That is why understanding the potential and limitations of water law is essential to the formulation of sustainable solutions in fluvial quarrels.

3.2.1 The Necessity of Understanding Sharia's Historical Evolution

Muslims consider *sharia*—the sanctified moral path to salvation —to be divinely imposed on the faithful of Islam, rather than something created by and for the humans who use it. Definite rules are few; *sharia* instead favours general moral guidelines. *Sharia* is composed of numerous (usually highly general) prescriptions expressed directly in the Quran, supplemented by the *sunna* (the practices and teachings of the Prophet; authenticated accounts of sayings of the Prophet that form part of the *sunna* are called *hadith*), *ijma'* (a consensus among those learned in the law), and *qiyas* (reasoning by analogy). 'Good' local custom (*'urf*) is recognized as a secondary source of law (al-Awa 1973). Most Islamic communities no longer consider *ijtihad* (independent reasoning) to be a valid mode of legal inquiry in the *sharia* tradition; as we shall see, those who are more impressed by the need to adapt to the modern world have revived the practice, while the Shiite tradition has always accepted *ijtihad* as a source of law (Schacht 1964: 69–75, 101–03).

The main impact of *sharia* then is to attach a powerful moral legitimacy to adjudication under its rules. It is that moral force, as an expression of divine will, that constitutes the essence of Islamic jurisprudence in all issues that concern the Muslim community (the *umma*), not least water and its political dimensions, even currently. Today, for example, a group of Muslim environmentalists have constructed an entire system of righteous justifications for environmental protection based on the principal foundations of Islamic law—the Quran and the *hadith* (Bagader et al. 1994).

Islamic law (*sharia*) differs from Western law regarding the ownership of water, its use, and the labour involved in its use. On the whole, the classical tenets of Islamic law are still functional but, despite their holy origin, they are interpreted differently depending on the doctrines of the particular school of *sharia*, the region where it is applied, and the specific issue involved. Throughout its history, *sharia* has undergone

adaptations that suited the requirements of the times and locales. Until the twentieth century, under both the Western and Islamic systems of jurisprudence, water laws largely delineated the relationship of individuals to the resource, treating the two as integral. As modernization altered the basic structures and institutions of society, in non-Muslim polities, terms such as 'use-rights' as opposed to 'ownership' increasingly became the legal concept preferred among codifiers of Western water law. The remainder of this section develops the principle tenets of Islamic water law.

First, however, it needs to be stressed that *sharia* is not a national law in the sense that American and European laws are. Historically, Islamic law has always been applied regionally and in modern times Muslim nations that have adopted secular national codes have retained juridical connections with *sharia* in various ways. For example, they declare themselves officially to be Muslim nations; they allow personal matters such as marriage and divorce to be adjudicated by *sharia* courts; and they have in various ways retained *sharia* influences by writing into their national codes explicit Islamic sensibilities. Consider Egypt since its 1952 revolution. Egypt's constitution then and now declares the nation to be Islamic and its national codes allowed for *sharia* courts where issues such as divorce and inheritance could be referred for settlement. Today, bespeaking the rising influence of Egypt's Muslim Brotherhood and of Islamism generally, the Law of Parties prohibits a political party's principles, purposes, and politics from contravening the doctrines of *sharia*, 'these being the main source of legislation in the country', '*the* main source' replacing a construction in Arabic that amounts to '*a* main source of legislation' in the constitution of May 1981 (Guindi 2006).

3.2.2 The Fundamentals of Islamic Water Law

Water has been historically central in all Muslim societies. The double meaning of the word '*sharia*' verifies this statement. In its most generic sense, *sharia* signifies the moral path that Muslims must pursue to attain salvation. In an older and more pointed sense, it denotes the path for access to the source of pure drinking water—it is 'the place from which one descends to water and is the law of water.' Yet despite the salience of water, hard-and-fast rules of Islamic water law are relatively few. Consequently, as concerns water issues, custom (*'urf*), analogy (*qiyas*), and consensus (*ijma*) have been applied more than strict classical doctrine—though legal traditionalists perceived the moral legitimacy of such rulings as diminishing in direct ratio to the distance they strayed from established dogma (ibn Manzur 1959, v.3: 175).

Water (*ma'*) is mentioned in the Quran 63 times, river and rivers (*nahr* and *anhar*) 54 times, and drinking water (*shariba*) 39 times. Despite this, water appears in the Quran without a clear legal character or sanctions. The emphasis in the Quran is on water as the source of life and on reminding Muslims that water is a gift of God, not a mundane thing, and that humans are stewards (*khulafa*) of that life-giving resource:

> *Have not the unbelievers then beheld that the heavens and the earth were a mass all sewn up, and then We unstitched them and of water fashioned every living thing… And you see the earth barren and lifeless but when we send down water upon it, it thrills and swells and puts forth every joyous kind of growth… We send down pure water from the sky, that We may thereby give life to dead land and provide drink for what We have created….*

The Traditions (*hadith*) of the Prophet Muhammad offer no more precise concepts than the Quran. For example,

> *He who withholds water in order to deny the use of pasture, God withholds from him His mercy on the Day of Resurrection, [and] Excess in the use of water is forbidden, even if you have the resources of a whole river, [and] The surplus of a well must not be withheld.* (Quran, Sura 21:30, Sura 22:50, and Sura 25:48–49 in Arberry 1980, v.II; al-Farra 1938: 198–205; Bukhari 1983, v.3, bk. 40: 543–544, 547; ibn Qudama 1969, 4: 61–63; Mawardi 1983: 158)

Muslim jurists have consistently treated water, land, and crops as indivisible, and water rights have generally been restricted to amounts considered adequate for a given crop area. This practice is based on one of the few stipulations the Prophet is said to have articulated in a hadith concerning water: The sum of water to be drawn was not to exceed that which is needed to cover a cultivated plot to two ankle's depth (literally *qaᶜbayn*). In the Mahzuz Valley dispute, the Prophet decreed, 'water over the depth of two ankles cannot be withheld by the owner of the higher [ground] from the owner of the lower lands'. The Prophet also ruled in the case of the Mahzuz torrent that palm tree owners had a right to water to the depth of two heels, and that sowers have a right to water as high as two straps of the sandal, after which the water is sent to those lower down (al-Farra 1938: 195–208; ben Adam 1967: 71–76; Bukhari 1983, v.3, bk. 40: 547–550, 557; ibn Qudama 1969, 5: 42–43; Mawardi 1983: 156; Ziadeh 1993: 3–12).

These provisions hypothetically fixed the basic legal principle for allocating water in Islamic law. By and large, the relatively few *hadith* concerning water appertain to rights of ownership of wells and springs, to rights of access to water, the obligation to share water, and prohibitions on selling water. For purposes of use, allocation, and adjudication, water is categorized according to source (river, well, spring water, rain, snow, and hail). It is further divided by use: pure (*taher*) for both religious and mundane purposes, clean (*tahur*) for drinking, cooking, irrigation, etc., and polluted (*mutanajjis*) which is unfit for either religious or mundane activities. In practice, however, *sharia* recognized only two broad categories of water within which all others are comprehended: owned and not owned (ibn Qudama 1969, 5: 43–44; Naff & Dellapenna 2002: 477).

3.2.2.1 The Salient Role of Custom

Islamic jurisprudence has had to address the same, no less complex, issues of ownership, usage, custom, and regulation of shared water as all other systems of law. Islamic water law is, in the main, customary, i.e., '*urf*, with *'urf* constituting the main source of Islamic water law. The reason for this was twofold: first, jurisprudentially, water fell more often than not into the penumbra of *sharia's* unstipulated rules that

derived from tribal customs that were Islamicized, and, second, there was the need for flexibility (or fluidity) in the application of law when water is involved. The underlying principle of fairness that legitimated the early hydro-union of *sharia* and *'urf* has been neatly stated in this contemporary way: 'If the system works, leave well [enough] alone, so long as it fulfils the basic principles of justice' (Wilkinson 1978: 91). Justice, fairness, and balance are qualities stressed throughout the sources and maxims of *sharia* pertaining to water.

Despite its necessity, '*urf* is a precarious legal principle in application. It is generally assumed that customary norms underlie customary laws in both Islam and the West, but this assumption is burdened by legal problems for both juridical systems. Since such norms are not codified (or, in the case of Islam, not always sanctified), and are always dynamic and usually imprecise, it is difficult to prove their existence jurisprudentially. This problem manifests itself particularly regarding water systems because each is in its own way unique. The upshot is that customary law can be and often is inconsistent or applied idiosyncratically in both *sharia* and Western water law when that is heavily imbued with custom and tradition (Naff & Dellapenna 2002: 475).

This quality of idiosyncrasy that attaches to '*urf* has often complicated international transboundary riparian disputes among Muslim states or between Muslim and Western states because, in the absence of firmly recognized rules of law, diverse customs and traditions can be mutually contradictory. This circumstance can make other contributory factors to the dispute, such as political ideology, power relationships, usage, allocation rights, and hydro-geological claims more complicated and more difficult to resolve, as the conflicts over the Jordan and the Tigris-Euphrates rivers demonstrate. In an earlier age, the way that 'urf and sharia were in some degree harmonized was through a tactic employed by many jurists: if *sharia* did not appear to cover a particular local or cultural water-related issue, jurists usually applied local custom and Islamicized it (Wilkinson 1978: 88). Today, these principles have been developed in the *usul al-fiqh* (jurisprudence) as a body of law that only indirectly depends upon the Quran, *sunna*, and *hadith*.

3.2.2.2 Water and Ownership

Muslim jurists consider water generally to be beyond private ownership—*mubah*—that is, a substance that cannot be owned unless it is taken in full possession, such as water contained in a jar or a privately dug well—but only the water in the well, not its source. This position is based on the belief that water originates with God and, in principle, belongs to His community; thus, ownership of water in any form will always be qualified. If water is claimed by the state, the ruler is considered to hold it in trust for the community or nation because in a *hadith* the Prophet is said to have declared that '*…Muslims [humankind] are co-owners in three things: water, fire, and pasture*.' Hypothetically, no person or ruler may appropriate a river or sell, rent, or lease its water, nor may such a resource be taxed; only a product that results from its use may be subject to a levy by the state. Notwithstanding these

injunctions, few, if any, Muslim states today allow the use of water without some kind of tariff, whatever it is labelled (abu Yusuf 1981: 209; al-Rahbi 1973: 636–38, 646–48; Bukhari 1983, 2: 102; ibn Qudama 1969, 4: 61).

One school of Muslim law, the Maliki, is exceptional in that it extends to individuals broad, firm rights of ownership and with them, the right to refuse 'the use of such waters to any or every one; or he may consent to their sale to anyone he pleases at his discretion, just as if the water was in his actual possession, as in a pot, a jar, a water bag, or bowl.' These rights end if the denial of water for any reason might result in the death of a person: 'In such circumstances, water must be abundantly provided without payment, and all ulterior claims are forbidden' ibn Ya'qub (1980), at 256; ibn Qudama (1969, 4: 61); al-Rahbi (1973), at 651; Yahya ben Adam (1967), at 75–77. The Maliki position could be roughly analogous to the Western legal concept of absolute ownership or absolute sovereignty regarding a water source. The other schools of Islamic law have rejected or sharply limited any right to sell water. According to Tradition, 'a man of the desert' (i.e., a Bedouin) asked Muhammad, 'Oh Prophet! What is a thing that is not legal to withhold?' and the Prophet answered, 'It is not permitted to withhold water and salt.' On this principle, water for irrigation must be accorded a neighbour who for any reason has lost his water supply and whose crops are in danger of being fatally parched. In fact, there are *hadith* allowing the use of arms if water is denied unjustly or if refusal to its access causes a threat to life: 'If I were not to find a passage for the water but on your belly I would use it!'—purportedly said 'Umar b. al-Khattab, Companion of the Prophet and second Caliph. On another occasion when 'Umar was told of a tribe that refused access to water to people who needed it, he is said by tradition to have asked them, 'Why did you not use arms against them?' (al-Rahbi 1973: 651; ben Adam 1967: 75–77; ibn Anas 1989, 15: 190).

3.2.2.3 Water and the Treatment of Enemies

There are few precise or specific rules regarding whether an enemy, particularly a non-Muslim enemy, should be given water. Though it was generally assumed that *sharia* allowed the strategic use of water in warfare, it was inexplicit about the matter. The *hadith* were clear that such use of water was permitted (al-Shaybani 1958–1960: 366–368). The clearest statements on this matter are found in those parts of *sharia* dealing with *siyar* (military campaigns). During the battle to recover Jerusalem from the Crusaders, Salah ad-Din seized the aqueducts that supplied the city and severed the water supply. When the 'thirst crazed infidels' surrendered, Salah ed-Din granted them *aman* (safe conduct or security) and they were given water lest they perish.

As at Jerusalem, enemies who surrendered on terms were to be given *aman*, therefore access to water. To inflict any further punishment without just cause would have been a breach of *sharia*. Not only was drinking water to be made available, but so too should water for animals, domestic purposes, and irrigation. Such treatment of an enemy under *aman* or *haram* (refuge or asylum), even a non-Muslim, was based on the *hadith* that Allah made Muslims co-trustees of water, fire and pasture.

The point is underscored by the juridical reasoning that if one were given the right to deny an enemy water even though he were under *aman*, that would be tantamount to granting a license to kill him, which would contradict the principle of *haram* (al-Shaybani 1958–1960: 366–368). Given the dictum that no one may be denied water if survival were at stake, it can be assumed that enemies are included under that broad judgment. The Quran and the *hadith* are clear that gratuitous cruelty towards anyone is forbidden, a dictum that is largely ignored by current Islamic extremists.

3.2.2.4 Science, Engineering, and Pre-modern Islamic Water Law

Muslims were able in part to overcome textual vagaries and generalizations of the Quran and the *hadith* by means of their engineering and scientific skills regarding the movement of water, irrigation, and water quality. In reference to the latter, eleventh century sources cite three techniques for determining the relative quality of water: differences in specific gravity, boiling point, and flocculation rates (Wilkinson 1978: 89). In fact, before Islam, a broad cross-cultural learning in mathematics, science, engineering, and various technologies had been developed and applied to producing a wide array of hydraulic facilities in China, India, Persia, Greece, and Rome. These achievements included brick construction, dressed stone, rubble, mortar, and cement, as well as bridges, aqueducts, canals, inverted siphons, *qanats*, cisterns, sluices, and silt traps. Water was lifted by water-driven paddles, pulleys, counter-balances, cogs, and Archimedean screws. These constructions and mechanisms were used in both permanent and ephemeral surface water and ground water (Wilkinson 1978: 89–93).

These achievements became a rich legacy absorbed by Muslim societies as their sovereignty spread from North Africa to India. In their turn, they contributed to progress in all those fields and to practical developments in the fields of hydrology, water distribution and control, and hydro engineering. Muslim jurists addressed most of these applications as well as the various evolving hydrological employments of water within the relevant rules of *sharia*, including new developments as they appeared—so long as the fundamental principle of fair dealing was followed in their use.

3.2.3 An Elemental Profile of Traditional Islamic Water Law

When the foregoing qualities of water-related *sharia*, *hadith*, and custom are combined with the characteristics of the resource, a basic profile of Islamic water law emerges. Islamic water law is largely customary, highly pragmatic, and supple in its application of moral principles and guidelines. Persons may not be denied the water necessary for survival or livelihood, and while animals have clear legal rights to water, humans take precedence. Drinking water for man and beast and water for domestic uses take priority over agricultural needs. Once all drinking and domestic

requirements of the community are satisfied, *sharia* recognized a right to irrigated land—*shirb*. These activities did not occur sequentially but simultaneously; the serial quality mirrors the order of priority in which *qadis* (judges) weighed the legal issues brought before them.

Although *sharia* literature devotes attention to the duties of irrigators regarding the maintenance of irrigation ditches and admonishes against wasting water that would otherwise benefit downstream users, it is not so clear about an obligation to maintain the quality of water for those same consumers. Water is considered to be an overriding community interest, and Islamic law deems its treatment as a product for commerce or speculation as immoral. Surplus water was shared according to customary standards, or by agreement, or even by casting lots. Hoarding of surplus water by individuals even if all of the needs of the community are met, is forbidden, though collective or community hoarding, i.e., storing for future collective use, is not expressly prohibited. Otherwise dams and reservoirs would have been unlawful. Generally, in the exploitation of water, the principle of proportionality or fairness is stressed (abu Yusuf 1981: 205; ben-Adam 1967: 71–76; Bukhari 1983, v.2: 103–06; ibn Qudama 1969, 4: 61–63; Naff & Dellapenna 2002: 479–80; Norvelle 1974: 30–35, 37–43 45–46, 55–58, 77–81, 85–88; Varisco 1983: 369–373, 376; Wilkinson 1990: 61).

Sharia rules governing the appropriation of water originate in the rules regulating the appropriation of land, i.e., appropriation and use must derive from an input of labour, e.g., building an irrigation canal. Only the fruit of such labour counts in matters of ownership and gain. It is the irrigation channel itself and the irrigated field and its crop that may be owned in inalienable right (*mulk*) by virtue of the labour that created them, not the water that flows through the one into the other. Water is the product of God's creation and belongs to Him, not to humankind, and therefore can be used only transitorily in accordance with *sharia* and *'urf*. By and large, Islamic water law, as adumbrated in the *hadith*, reflects the Prophet's effort to protect the smaller, less powerful users of land and water.

3.3 *Sharia* and Water in the Modern Era: Jurisprudence and Political Reform

Over the course of Islam's history, Muslim rulers and jurists alike recognized that if *sharia*—and Islamic society and governance—were to avoid stagnation and continue to be relevant and dynamic, the law had to remain contemporary. A means by which novelty and modernity could be legitimated had to be found within *sharia* itself. *Usul al-fiqh*, jurisprudence, the process of law with a vision of what the rule of law requires in a given instance, became the chief mechanism by which *sharia* was made to move with the times. It became an accepted principle of *usul al-fiqh* that one can neither object to nor deny a change in law necessitated by current conditions. The political counterpart of *usul al-fiqh* was the principle of *maslaha*, originally meaning to be pious and righteous, but later meaning to mend

or improve, and ultimately to reform in the modern political sense. *Maslaha* was used by the ruling authority to justify actions that may have carried dubious Islamic credentials but could be allowed under *sharia* if they were perceived to be for the good of the Muslim community.

Ottoman sultans, from the late eighteenth to the early twentieth century, consistently legitimated their modernizing reforms on the basis of *maslaha*. After the fifteenth century, Islamic jurisprudence was increasingly built up from the legal rulings (*fatwas*) of practicing Muslim jurists so that today Islamic law is found almost exclusively in the writings of reputable Muslim jurists derived from references to the Quran, *sunna*, and *hadith* only in an ancillary way, depending on the specific area of the law to be applied (Naff & Dellapenna 2002: 475).

3.3.1 Reform and the Ascendancy of Western Law

Water issues in most of the Islamic world were regulated for about 1,300 years by the precepts of *sharia*. The modern era, however, demanded new methodologies and approaches in Muslim jurisprudence, including water law. Under the impact of Western colonization and the reforms and modernizations of the nineteenth and twentieth centuries, Islamic society itself underwent significant transformations, mainly in the direction of secularism. The Ottoman Sultan Selim III set out to refashion the military and diplomatic establishments of his empire using European models. His endeavours were truncated by an alliance of the *'ulama* and Janissaries who, in 1803, overthrew Selim and later assassinated him (Naff 1963). But the seeds of reform had been planted and sprouted over the next 2 decades, bearing fruit in the first great reform edict issued by Mahmud II in 1839, after he had destroyed the Janissaries and with them the power of the '*ulama* for the remainder of the century. The edict, the *Tanzimat*, laid the bases for all subsequent institutional, political, legal, educational, and economic reforms in the remainder of the century.

In Islamic thought, the only justifiable change in the rules of governance of the *umma* was the moral and social betterment of the community—with emphasis on the moral. Hence, attempts were made to Islamicize the reforms of the *Tanzimat* era, which were secular in nature, on the basis of traditional Muslim principles and Quranic injunctions such as: 'Behold, Allah does not change a people's condition unless they engender a [spiritual] change within themselves' (Quran 13:11). Changing the established legal system of the Ottoman Empire was not simply a matter of the sultan issuing a decree. Even though the power of the *'ulama* to rally supporters into the streets had been broken, reforming sultans had to take care not to outrage Muslim sentiments and of their subjects. Moreover, although the dominant school of law under the Ottomans was Hanafi, the sultan allowed the application of other schools in certain parts of the empire that enjoyed some autonomy. For example, the North African provinces followed the Maliki school in litigation. The legal reforms of the *Tanzimat* era began with a new Commercial Code in 1850, and following a second Reform Edict in 1856, several new codes

of law were introduced: the Civil Code (*Mecele* or *Majalla*) and the Land Laws, both in 1858, a Penal Code in 1858, a Code of Commercial Procedure in 1861, and a Code of Maritime Commerce in 1863. The new codes were based on European counterparts, especially those of France.

Under the *Mecele*, water and land rights were classified and registered in official cadasters. The *Mecele* and the Land Laws became residual law for several independent Middle Eastern nations that emerged from the partition of the Ottoman Empire following World War I, namely, Jordan, Palestine, Syria, Lebanon, and Iraq (Asim 1871, 1: 76–78, 223, 256–257; Cevdet 1884–1885, 6: 10–44, 80, 133, 137–40, 262; Kuran 1968; Karal 1942, 1946; Naff 1977: 3–14; Naff & Dellapenna 2002 at 480).

The concept of a separate, formally codified set of legal rules along European lines was in itself no small departure from the traditional Islamic way of dealing with matters under *sharia*. These new promulgations were meant to supplement, not to supplant, *sharia*. There was little hypocrisy in this approach. The reforming Ottoman sultans and their ministers were themselves devoted to Islam and determined to maintain *sharia* and the Muslim character of their state. A concrete example of this policy lies in the code of the Law of Obligations–contract, tort, and part of the Law of Procedure. The reformers codified this law in accordance with *sharia* principles of the Hanafi school, rather than basing it on a similar European code (Anderson & Coulson 1967: 37). The Hanafi school of law was founded by Abu Hanafi (d. 767). This school of law was preferred by most Muslim rulers, particularly the Ottoman sultans who adopted that *madhhab* as the Empire's dominant body of jurisprudence because the Hanafi school gave them greater leeway in exerting their authority. This quality was embedded in the Hanafi treatment of human judgment (*ijtihad*). Rather than insisting on rigid application of analogy, Hanafi jurists permitted modest pliancy in the use of human reasoning or judgment in the interpretation of the Quran and the application of *sharia*.

At the same time, the Ottoman reformers understood that in order to ensure the survival of their Muslim realm in a world that had experienced scientific and industrial revolutions that made their neighbours more powerful, efficient, and wealthy than their own Empire–a world where nations had steadily encroached upon the Empire's territory for more than a century—they had to modernize and secularize many institutions, including their legal system, in emulation of what was traditionally considered the Abode of War (*Dar al-Harb*), i.e., Europe. To vindicate the reforms from the time of Selim III onwards, the sultans invoked the principle of *maslaha* (reform for the betterment and security of the Islamic community), a precept that moved to the forefront of their moral justifications.

The secularization of law necessitated a new system of secular courts: the *Nizamiyya* courts (secular courts of general jurisdiction). Precedents for this action, such as the *Mazalim* courts (courts that dealt with political, criminal, and land cases), already existed. What changed most significantly was the status of the *qadi* courts that had hitherto been the standard courts of general jurisdiction. The *qadi* courts were relegated to private/personal law, i.e., family, marriage, divorce, inheritance, etc. and the *Nizamiyya* courts became courts of general jurisdiction. (Anderson & Coulson 1967: 37–38; Naff 1977: 88–108).

3.3.2 The Continued Relevance of Sharia for Water in the Face of Western Predominance

Over a century and a half, as the Muslim world became increasingly secularized, legal reforms became and remained acceptable by the community when they were seen as necessary and as beneficial to the *umma* and when *sharia* remained the moral guide. Despite the retention of the spirit or sensibility of traditional Islamic water law as part of the secular codes enacted over the past 2 centuries, the survival of western forms of law, including legal provisions regarding institutions for water management and for the membership of all Islamic countries in the United Nations, attests to the functional ascendancy of Western law. Even Muslim nations where *sharia* is the exclusive law have embraced the secular principles of the UN Charter, have signed and ratified UN declarations, conventions, and treaties, including those that created the International Court of Justice, and they have conducted their foreign relations in accordance with the jurisprudence of general international law (Mallat 1995, at 4–6 Naff & Dellapenna 2002: 480).

It is difficult to perceive how it could be otherwise. It is highly doubtful that *sharia*, without profound compromises to its dogma, could function effectively in the secular realm of international law, even with the path finding precedents of *kanun* (sultanic law), *mazalim*, *nizamiyya*, and *maslaha*. The reasons are evident. Traditional Islamic legal culture is centred on the spiritual salvation of the individual believer, that is, the principle of *'ibada* (the individual believer's obligation of service to God), and gives secondary standing to institutions and even to the state itself. *Sharia* does not acknowledge that any other system of law, canonical or secular, has equal standing with itself. The point here is that the doctrinal nature of Islamic law seriously limits its applicability and force as an instrument of foreign relations. Sharia lacks the institutional structures necessary to adjudicate international political, economic, or managerial affairs in today's interdependent, secular, global society. This is not to say that Western law can claim overall moral superiority to *sharia*, simply that Western law is institutionally better suited to the modern world.

Under the impact of European colonialism and the mandate regimes following the First World War, the *sharia* system of water law in most Muslim nations slowly—but not entirely—yielded to European models. Certain fundamental *sharia* concepts pertaining to water—concepts that had important implications for the management of what were becoming international water resources—remained intact, particularly that water is a free community property (*mubah*) and that communal rights (*musha*) are protected (Naff & Dellapenna 2002: 480). However, today all but a few Muslim states impose some form of toll on water and its uses. Moreover, *sharia* was able to serve successfully as the framework for relations between the Islamic and non-Islamic worlds historically only when an Islamic state such as the Ottoman Empire had the power to impose its will. International freshwater law is not a theological issue of individual believers but distinctly one of collective interstate relations, Muslim and non-Muslim alike. While the great majority of Muslim nations have enacted Western-model codes of law, and although the religious nature of *sharia* arguably restricts its efficacy as a kind of

general international law, and even though no Muslim nation practices *sharia* water law internationally, *sharia* cannot be entirely ignored.

Though in today's world, *sharia* is not in any direct, practical sense the governing word in the management and disposal of international water systems and has to a considerable extent been superseded by Western inspired water laws even within Muslim nations, it does lie at the heart of the Islamic world's legal culture. *Sharia* has never lost its moral hold on the Muslim community. Consequently, it carries relevance to these issues. *Sharia* provides the basis for understanding, say, the attitudes of Muslim farmers and legislators towards rights and access to water, whether water should be treated as an economic good or be taxed, who has prior rights or ownership, how much may be given to downstream users, what are the limitations of use, etc. If Islamic sensibilities are involved, *sharia* must be taken into account in these matters, at the very least as context for understanding how *sharia* may in subtle but important ways influence both the domestic management of water and international hydro-political agreements in the Islamic world.

3.3.3 Sharia and Environmental Protection

The idea of environmental protection as it has evolved over the past 3 decades in the West has come to be articulated in Islamic legal thinking only fairly recently, although nascent environmental movements have existed in Muslim nations for some time, and many Muslim nations have had to struggle with environmental degradation. Movements for the preservation and protection of the earth's resources in the Islamic world use Quranic and *sharian* arguments to invoke what amounts to an environmental code of *hisba* (promote good and prohibit evil) whose purpose is to persuade officials at all levels of government to behave in environmentally responsible ways. They argue that the original and primary duty of government is to secure the common welfare and protect against harm to the community, in support of which they cite the *hadith* that 'The management of subjects' affairs by the ruler shall be according to their welfare' (Bagader et al. 1994: 19–31). This includes the protection of the environment and natural resources.

The basic underlying principles of Islamic environmentalism are the same Quranic and *sharia* precepts that pertain to water and land but with a few items freshly interpreted from *suras* (chapters) in the Quran and *hadith*: the basic injunction is that the earth and its resources belong to God, who has bestowed them as gifts to humankind and who has made humans the stewards of the earth to manage it in accordance with the Creator's purposes. Other tenets more recently applied to the environment are: all peoples and species have a right to the earth's resources; each human has an obligation to protect the interests and rights of others; and each generation must use resources in ways that will protect their availability for succeeding generations.

Among recently interpreted environmental dictums is one that applies particularly to water: whatever is essential to the preservation of life (in this instance, water) is itself vital, and'…any action that obstructs or impairs the biological and social

functions of this element, whether by destroying it or by polluting it with any substance that would make it an unsuitable environment for living things or otherwise impair its function as the basis of life, any such action necessarily leads to the impairment or ruin of life itself'. The underlying juristic principle is, 'What leads to the prohibited is itself prohibited'. Muslim environmentalists insist that environmental protection is mandated by religion and *sharia*. They argue that one of *sharia's* most basic prescriptions is in the Maliki *hadith* according to which the Prophet declared 'There shall be no damage and no infliction of damage', and according to another *hadith* 'The averting of harm takes precedence over the acquisition of benefits', as well as others that pertain to public health in which Muhammad forbade urination in a water source, on a path, in a place of shade, or in the burrow of a living creature (Bagader et al. 1994: 6–7).

3.4 Conclusions: Law and the Hydro-Political Dimension

Since hydro-political problems almost always form a web of linkages, their solutions must always be commensurate with their complexities and must therefore be attacked simultaneously on several fronts. When a region suffers chronic scarcity, unsustainable population growth, maldistribution of water resources, ideological and political strife, and power inequities, the potential for water-related hostilities among neighbours, neighbouring communities, and neighbouring states becomes part of that region's environment of tensions. The probability for conflict rises as the tensions are heightened.

Water and demographics have always been entwined, with unsustainable population growth and its consequences having become a large and rapidly mounting factor that law and legal institutions must take into account when water scarcity becomes critical and protracted. A failure of ruling authorities to deliver basic public services destabilizes societies and governments. The consequence is that water quality, distribution, and usages are often adversely affected on the local, national, and regional levels. Technological solutions alone will not be sufficient if appropriate water laws and institutions do not accompany them. Again, while law cannot resolve water disputes by itself, law remains a critical ingredient for creating and maintaining an orderly and peaceful solution to such conflict.

On the international level, Muslim nations have long accepted that the world order is secular and they do not have the power to change that reality—despite the ideology of some extremist Muslim groups who would have it otherwise. Acceptance of that truth is buttressed by their experience in using the secular institutions of the international system. At bottom lies the controlling reality that today all Muslim nations have joined the UN and conduct their relations with the non-Muslim and Muslim worlds in accordance with the accepted norms of general international law and even, at times, invoke that law when contending with one another or with non-Islamic states. Generally speaking, the nations of the world tend to approach questions of international law, whether of freshwater

or otherwise, first from the perspective of national interest and relative power, then of the particular beliefs, values, customs, attitudes, and political ideologies that obtain in each society. In all of the hydro-political wrangles involving the major Middle Eastern river systems, none of the Muslim states in the region have as yet invoked Islamic law even in contending with another Islamic country—understandably so because, as already noted, there is no widely agreed-upon transnational Islamic legal instrumentality for doing so. Yet in many contemporary Muslim nations, particularly among those governments that are open to modern interpretations of *sharia*, professional water experts have been able to construct religiously sanctioned principles of integrated water management and utilization that incorporate principles found generally in Western derived law, including the international law principles of equitable utilization, no significant harm, and proportionality, and the national legal principles that water is a social and economic good, that water conservation is a core Islamic obligation, that privatization, albeit limited, may play a useful management role, and that the interests of the end-users must be upheld. Muslim water and legal specialists have enunciated these principles clearly (Bagader et al. 1994: 6–7). Even if these notions have not been fully, formally and publicly imbued with a specific Islamic cachet and adopted across the Muslim polity, they are increasingly being given recognition and importance.

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Chapter 4
Water in the Jewish Legal Tradition

Richard Laster, Rabbi David Aronovsky, and Dan Livney

> *If we were to walk in the woods and a spring appeared just when we became thirsty, we would call it a miracle. And if on a second walk, if we became thirsty at just that point again, and again the spring appeared, we would remark on the coincidence. But if that spring were there always, we would take it for granted and cease to notice it. Yet is that not more miraculous still?*
>
> Rabbi Israel Baal Shem Tov (1700–1760), Eastern Europe

Abstract The *Torah*—the five books of Moses—is the basis for Jewish law. To this day, all judgements handed down by the Jewish rabbinic courts derive their legitimacy by tracing their origins back to the *Torah*. In Jewish Law, water is symbolic of life. The importance of water quality and the dangers of drinking polluted water appear from the earliest period of Jewish history. While Jewish law allows private ownership of wells, a spring that flows beyond the area of the spring itself is considered, like rivers and the sea, to be in the public domain. The *Talmud*—Rabbinical commentaries on the *Torah*—generally adopts a system of water management that gives parties closer to a water source priority over those further away, and upstream riparians priority over lower riparians. Modern Israeli water law has little relation to Jewish water law. But because both have their roots in the same land, with the same dry climate and limited water sources, both developed laws in an attempt to ensure proper protection of water sources.

Keywords Environment • Jewish law • *Torah* • *Talmud* • water law

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4.1 Introduction

According to a famous *Talmudic* story (Babylonian *Talmud*, Tractate Shabbat: 31a), a gentile once approached Rabbi Hillel and asked to be taught the entire *Torah* while standing on one foot. Hillel replied, 'Love your neighbour as yourself. That is the entire *Torah*. The rest is simply an explanation. Go and learn it!' In much the same way, Jewish law can be described in one word—*Torah*. All the rest is simply an explanation.

The *Torah*, also known as the Bible, the five books of Moses, and the *Pentateuch*, was written over 3,000 years ago. Since then, Jewish law has developed various interpretations and applications of the *Torah*, interpretations of those interpretations, and so on. Jewish law contains civil dictates as well as religious protocol. Problems that arose in the framework of religious life and problems surrounding civil relationships both found solutions in the same legal source—the *Torah* and the *Halacha*, the Jewish legal interpretations and rulings.

This chapter on water law in the Jewish tradition provides insight into Jewish law and custom in general, and rules related to the protection of water sources in particular. One should not look, however, to find a written code of Jewish law, as there is none. Jewish law developed as common law from precepts set out in commandments and later interpreted by scholars and rabbis in individual cases. This chapter first gives an explanation of Jewish law and follows with precepts used in the interpretation of water use and misuse. Modern Israel did not adopt this approach when the State was founded. Seven years after the founding of the State, the Knesset legislated the first of four major Water Laws delineating the rights and responsibilities of the State and the public in the use of water (see Chapter 8, Laster & Livney, this book). The relationship between the precepts in this chapter and modern Israeli water law is minimal and therefore the value of this chapter is in its historical importance rather than its modern affinity.

4.2 Jewish Law

This introduction to Jewish Law is based largely on the writings of Menachem Elon (Elon 1978). The *Torah*, the eternal and ultimate law of the Jews, is not subject to changes, additions or subtractions. According to tradition, God gave it to Moses on Mount Sinai. Not only was the revelation word for word, but letter for letter. The meanings of the text were revealed to Moses, who passed this knowledge on to Joshua, and so on down the generations. To this day, all judgements handed down by the Jewish courts and rabbis derive their legitimacy by tracing their origins back to the *Torah*.

In Judaism, the word *Halacha* is used to refer to all Jewish laws, whether they be concerned with interactions between man and God (religious precepts) or interactions between man and man (civil and criminal law). At the core of *Halacha* are the commandments and prohibitions enumerated in the *Torah*, though over the years various rabbis, Jewish courts, and scholars have added their own explanations and additions—adding to and diminishing from the precepts in order to adjust them to

new situations that arose as the nation matured. The laws and precepts were eventually collected and organized by the rabbis into specific legal codifications.

4.2.1 Major Historic Compilations of Jewish Law

There are seven distinct historical compilations of Jewish law, the earliest dating back more than 3,000 years. The *Written Law* (1092 BCE), the *Torah*, is the first and official source of Jewish Law (Elon 1978, 1: 834). The official sources for *Halacha* after the *Torah* are the books of the Prophets and the Scriptures (1092 through 500 BCE) (Elon 1978: 834). There are few legal anecdotes, however, in the Prophets and Scriptures. Their authors were concerned with the various internal and external wars of the time, and were thus not concerned with legal strictures. The *Torah*, together with the books of the Prophets and the Scriptures, comprise the *Tanakh*. Christians refer to the *Tanakh* as the Old Testament.

A *General Literature* (500 BCE through 70 CE) followed, comprised of the writings from the times of Ezra and Nehemiah, the last authors of Scriptures, until the end of the Second Temple (Elon 1978: 840). There are no official authentic sources of the laws compiled in this era. Nevertheless, there is general and legal literature from this time which indicates a vast knowledge of the *Halacha*. These sources do not always provide an exact and accurate description of the *Halacha* since not all of the sources' compilers were knowledgeable of the religious and legal strictures.

The *Mishna* (120 through 220 CE) was written around the year 200 by Rabbi Yehuda Hanassi in the town of Tzipori in the Galilee (Elon 1978: 858). It is the largest and most important literary source of *Halacha* from this era. Hanassi wanted to compile oral Jewish law into a codex of *Halacha*. The *Mishna* includes both a case-based formulation of *Halacha* and a normative formulation that outlines the legal principles behind certain laws. Other sources of oral law from this period are the *Halachic Midrashim* and the *Tosefta*. The *Halachic Midrashim* are compilations of laws that correspond directly to a written law from the *Torah*. The *Tosefta* contains additional rules of the oral law not included in the final version of the *Mishna*.

The *Talmud* (200 through 500 CE) is an interpretation of the *Mishna* (Elon 1978). The *Talmud* also includes philosophical speculations, discussions of etymology, recipes for medical remedies, anecdotes concerning biblical figures, astronomical observations, and even advice concerning one's sex life (Chevlen 1998). It documents legal arguments concerning the *Halacha* and the content of the *Mishna* that occurred in the various study houses at the time. Sometimes, the *Talmud* includes a decisive legal decision. Even if the *Talmud* is not designed and arranged like the legal books of our day, it is possible to use it as a legal tome. Today, it is viewed as the accepted comprehensive compilation of Jewish law, and is the final authority for Jewish observances.

The Books of Explanations and Innovations (700 through 1150 CE) are books of *Halacha* written to explain the *Mishna* and *Talmud* in a literal and topical fashion (Elon 1978: 908). They aimed to resolve the contradictions that arose in different

places in the *Talmud*. As a result, these books provide specific rulings based on these resolutions.

The *Books of Halachot and Judgments* (700 CE through today) record the work of Jewish scholars in providing the final conclusion to various *Halachic* discussions that were left open-ended in previous books of *Halacha* (Elon 1978: 939). The judgements are recorded in a specific order, and were reached by *Halachic* scholars after a prolonged study of the *Halacha*. This genre is most similar to the legal books of today.

The *Mishneh Torah* (1170s–1180s), also called the code of Maimonides or *Yad ha-Chazakah*, took Maimonides (the Rambam) 10 years to complete. It codifies almost 15,000 laws from the *Talmud* (University of Miami 2007). The legal code known as the *Shulkhan Arukh*, was compiled by the Sephardic rabbi Joseph Caro of Zefat 400 years after Maimonides, in the sixteenth century (University of Miami 2007). It remains the standard legal code of Judaism. When rabbis, particularly if they are Orthodox, are asked to rule on a question of Jewish law, they generally consult the *Shulkhan Arukh*. It is divided into four volumes: laws of prayer and of holidays; diverse laws, including those governing charity (*tzedakah*); *Torah* study and the Jewish dietary laws; and marriage, divorce and civil law. The *Shulkan Arukh* and other post-*Talmudic* rabbinic commentaries explain how a Jew should live his daily life in accordance with the *Torah*.

4.2.2 The Legal Sources of Jewish Law

There are six recognized sources of Jewish law (Elon 1978: 212). First is the *received law*, legal explanations given by God Himself and passed down from generation to generation in oral or written form. A law from this source cannot be developed or changed. Second are *interpretations*, explanations of the Written Law and *Halacha* in the different eras. Third is *legislation* enacted by the *Halachic* authority and concerning public authoritative bodies. Fourth is *custom and usage*, which refers to different strands of practice that arose in different Diaspora Jewish communities. Fifth is *case law*, referring to legal decisions or the practice of a *Halachic* authority in specific cases. Finally, sixth is *legal logic*, referring to the personal and legal logic of *Halachic* authorities.

4.2.3 The Jewish Judicial Framework

Jewish Law's most formative moments came at a time when the Jews were exiled across the globe. The exiles of the Jews from the land of Israel includes the Assyrian deportation in 722 BCE, the exile to Babylonia in 597 BCE and the Roman exile of many Jews in AD 70. Although the Jews lived under foreign rulers, they managed to maintain their own laws and court systems throughout the Diaspora. The leaders of the community obtained 'Letters of Merit' from the governments under which they lived ensuring the independence of Jewish Law and giving its protection to

the Jewish courts and Jewish internal rule (Elon 1978: 7). Jewish Law was thus followed, not just for all aspects of personal, civil and religious law, but in a large portion of communal cases as well.

How were the Jews able to establish judicial autonomy under foreign rule? The answer depends on an understanding of the concepts of 'rule' and 'jurisdiction' as they were defined and practiced through the eighteenth century (Elon 1978: 34). Up until the nineteenth century, most states recognized the judicial frameworks of various minority groups living under their rule. In this political–judicial reality, it was possible to establish an autonomous Jewish body with autonomous rules of conduct.

4.3 Jewish Water Law

Water has long been of central importance in Judaism, which is perhaps only to be expected for a people that lived in a largely semi-arid or arid land. This importance gave rise to a body of water law within Jewish law—a body of law largely, but not completely, focused on protecting water quality. This section addresses the importance of water in Judaism and then the precepts of Jewish water law.

4.3.1 The Importance of Water in Judaism

The magical powers of water were first revealed on the second day of creation, when God separated the waters of the earth from the waters of the heavens (Genesis 1:6–8). Commentators marvelled at God's creativity, giving water the power to both obey and simultaneously defy gravity. On the third day of creation, God gathered all the water on earth into certain areas, allowing the formation of the continents and thus dividing the world into dry and wet parts. Commentators point out how this defies water's natural tendency to spread out evenly in all directions. These and other qualities led the wise men of Jewish Law to treat water as a symbol of life itself (Jerusalem *Talmud*, Tractate Horayot, 3:5). Water is referred to in the *Torah* as a basic life force alongside bread and crucial for life (Exodus 34:1(28); Kings I, 17, 18:4, 18:13, 22:27). Guests were greeted with bread and water, and their absence was seen as an expression of hostility. Wine replaced water as the drink of choice only on special occasions (Genesis 14, 18; Samuel A, 11, 25; Ecclesiastes 7, 9; Proverbs 5, 9).

When God wishes to compensate good deeds, he blesses a person's bread and water (Exodus 23, 25). Alternatively, a punishment of those who go against God's wishes likely involved depriving a person of bread and water (Ezekiel 4:16). The first plague God inflicted on the Egyptians turned all the surface waters into blood, cutting off their water supply (Exodus 7:19). Similarly, when laying siege to a town, the first step taken by the attacking army was to shut off the water supply (*Midrash Tanchuma*, Parshat Bo 4). When deciding to destroy the world, God used an enormous flood to wipe out the world, sparing only Noah, his family and representatives of the various species of life (Genesis 6–8). Elijah the prophet declared a drought

that will last for years because King Ahab and Queen Jezebel 'did evil in the eyes of the Lord' (Kings I, 16:30, 17:1).

Before entering the Promised Land, God explained the different regional water management systems to the wandering Jews. While in Egypt they had drawn water from the Nile to irrigate the fields, in the Promised Land rainfall was the main source of water for agriculture. 'For the land that you are about to enter and possess is not like the land of Egypt from which you have come. There the grain you sowed had to be watered by your own labours, like a vegetable garden; but the land you are about to cross into and possess, a land of hills and valleys, soaks up its water from the rains of heaven' (Deuteronomy 11:10–12).

This difference is interpreted by some as complimenting the lush land of Israel in comparison to the hard work required to irrigate in Egypt. Others interpret God's statement as a warning to the Jews. Their existence, like the annual rainfall, is not a given. It depends on how well they uphold the *Torah* and God's commandments. 'Beware, lest your heart be seduced and you turn astray and serve other gods and worship them. Then the wrath of the Eternal will blaze against you. God will restrain the heavens so there will be no rain and the earth will not yield its produce. And you will perish quickly from the good land which the Eternal gives you' (Deuteronomy 11:13–21).

When the winter rains were late in coming, the rabbis called for the people to fast. 'At first only the scholars observed three fasts, fasting from dawn to dusk on the Monday and Thursday of one week and Monday of the next. If no rain came after these fasts, the rabbis called on the public to observe three similar fasts. If rain still did not fall, the public was called upon to observe three more difficult fast days, fasting from dusk to dusk, as on Yom Kippur. If the rain still did not fall, the public fasted for 7 days, on Mondays and Thursdays over the course of 4 weeks. No more general fasts were called if the drought continued, but the public observed mourning customs and scholars continued fasting twice a week until the end of Nisan, after which rains were no longer desirable since they would ruin the barley crop' (*Mishna Ta'anit* 1:4–7). Some interpretations take this so far as to consider a rainy day on par or even above the day of the rising of the dead or the day the *Torah* was given (*Mishneh Rosh Hashana* A and B).

According to Jewish tradition, the happiness of the renewed meeting between the water of the heavens and the water of the earth is like the fertile meeting of a man and a woman. The prayer for rain *Tfilat HaGeshem* is recited for 6 months. This goes on from the end of the fall harvest festival *Sukkot* until the first day of the Passover spring festival, when the word 'dew' is substituted for the word 'rain'.

4.3.2 The Chronological Development of Jewish Water Law

Jewish water law can be divided into two chronological periods. In the first, the laws found in the *Torah* created water law to manage water use and protection, mainly in the context of the biblical land of Israel. The other category begins after

the migration of the Jewish people from Israel to the four corners of the earth. It should be noted that although the destruction of the second temple by the Romans in 70 CE is considered the beginning of the Jewish Diaspora period, there remained Jewish cities and villages in Israel and Babylonia where Jewish legal autonomy and Jewish law continued to apply for centuries afterwards.

During the first period, from approximately 1800 BCE to 500 CE, water law developed and advanced in both the public and private sectors, in tandem with the progress made in the water supply systems. In the early biblical period before the Common Era, the main water sources were public wells, and water was divided on an equal basis. In the *Mishnaic* Period (100–200 CE), technological developments enabled the creation of water supply systems. Three types of water ownership developed: private, municipal, and national. Laws developed to limit the private usage of public water, to develop methods of dividing water between different users, and to prioritize according to importance. At the end of this period, there were discussions concerning ownership in cases of doubt, and the expropriation of certain water sources for the public good. Methods of financing the construction, maintenance and operation of water supply systems were created during the *Talmudic* period (200–500 CE). Laws regulating the personal usage of water also developed during this first period. Management systems developed for controlling water quality, including drinking water quality and water for purification rituals like hand-washing and ritual baths or *mikvah*. Agents of the rabbinical court *beit din* were responsible for protecting the hygiene levels of the different public water sources.

The *Talmud*, *Mishna*, *Gemara*, and other Jewish texts written after the exile are based less on the land of Israel and more on a personal and world view. The Jewish exile also created a change in Jewish occupations. In the land of Israel in biblical times, the Jews were an agrarian society, while in other countries most Jews became tradesmen rather than farmers. Thus Jewish water law became less occupied with agricultural usage. Lastly, while some governments until the nineteenth century allowed their Jewish communities some legal autonomy, others did not. In modern times, Jewish water law is applied only on a personal basis by religious Jews, and cannot supersede local law, even in Israel.

4.3.3 Ownership of Water

In Genesis, the first book of the *Torah*, a vivid description is given of a dispute between Isaac's herdsmen and the herdsmen of Gerar (near present-day Gaza) over ownership of a well (Genesis 26:17–22). The Ramban, also known as Rabbi Moshe Ben Nachman (1194–1270), explains that the dispute has legal ramifications over water ownership. If the Gerar stream fed the well that Isaac had dug, as the herdsmen of Gerar claimed, then they would be right in their claim to ownership. But in fact the *Torah* identifies independent springs as the source of the well, giving Isaac ownership (Ramban's interpretation of Genesis 26:25). A second interpretation agrees that the shepherds were correct in identifying the well as being fed from the Gerar,

but nevertheless gives Isaac legal ownership of the waters of the well he dug. This is similar in principle to water law in those countries that allow a landowner to dig a well and use ground water even at the expense of his neighbour.

In another case, Jacob finds the shepherds of Padan Aram (the plateau of land between the Tigris and the Euphrates, which today extends from Iraq through Syria and Turkey) waiting for additional shepherds to arrive in order to be able to remove a large stone placed over the mouth of a well (Genesis 29:1–10). This primitive locking system prevented individual passers-by from accessing the well, while providing access only to the shepherds en masse. Jacob removes the stone by himself.

These two cases show that the *Torah* gives both individual ownership to wells as in the case of Isaac, and public/municipal ownership as in the wells of Padan Aram. The *Torah* also hints at a third type of ownership, that is government ownership of a water source. For example, during the exodus from Egypt, the Jews wish to cross the land of Moab and drink from its rivers. Moses makes the request to the King of Moab, offering to pay for access to the rivers there (Ramban's interpretation of Numbers 20:19).

According to more recent Jewish law, a spring that flows beyond the area of the spring itself is considered, like rivers and the sea, to be in the public domain (*hefker*) (*Toseftal Baba Kamma* 6:4; Jackson 2006). Concerning a spring that flows naturally and does not flow beyond the immediate area, the law and its interpreters are divided as to public or private ownership rights. In principle, a well is owned by the owner of the land where it is dug, unless the owners sold or gave the rights to the well to another. A well in biblical times is commonly not a natural source, but rather a reservoir that collects rainwater and runoff that is directed to it—a waterhole or cistern. In this case it makes sense that the ownership of the water and the well go together, and Jewish tradition (*halacha*) agrees.

4.3.4 Rights to Use Water

In ancient times, customary law recognized public sources of water that anyone who is a member of that public has the rights to take without payment (Genesis 24:11–21 and 29:2–3; Exodus 2:15–17; *Mishna Beitza* 5:5; *Tosefta Baba Kama* 6:4). This public right to use water applied both within communities and between communities.

4.3.4.1 Within a Community

In the period of the *Mikra* (1800–538 BCE), the public well was generally sited outside the city (Genesis 24:11), while in the period of the *Mishna* and the *Talmud* (100–600 CE) the public well was generally found in the centre of town. A situation where a person was required to pay for drinking water was considered in the Bible

as a time of calamity (*Ekhah* (The Book of Lamentations) 5:4). Nevertheless, such situations arose where, due to severe climate conditions, water was sold as a commodity (*Bechorot* 4:9). The private right to public water sources was not without limits (*Tosefta Baba Metzia* 11:29). A waterhole that was dug for use in a town gave drinking rights to all town citizens, including the right to take water home, but forbade the sale of these waters. Jewish law excluded industrial use from free access to public water (*Tosefta Baba Metzia* 11:30).

During the period of the *Mishna*, responsibility for developing, maintaining, and operating water sources was given to the court (*beit din*), which in turn appointed specialists in the field (*Tosefta Shekalim* 1:2). The court took care to protect water that collected in water holes during the winter and their distribution for the public good in the summer (Ramban, in the *Mishne* interpretation *shekalim P'A M'A*). On a certain day in the spring, emissaries of the *beit din* would go out and dig wells, ditches and caves, and repair the *Mikvaot* and the water canals (*Tosefta Shekalim* 1:2). During the period of the *Mishna* and the *Talmud*, water holes were dug by a specialist, who was a city employee paid from the public coffers. The profession was seen as filling an urgent public need, and was a source of pride (*Kohalat Raba* 4:18). Another profession connected to water supply was called the *bayar*, the exact requirements of which are unclear. Some say that he would draw water from the public water holes and sell them to the public (Ramban, an interpretation of the *Mishna* 7:8; *Mishna* 5), while others claim he would dig holes himself and then sell the water (Rabeinu Shimshon, in an interpretation of the above chapter).

During holidays, work was forbidden, but the *Mishna* allowed the repair of water canals and pipes that brought water from its source to the city on certain lesser important holidays (Babylonian *Talmud*, *Moed Katan*, ch. 1). The *Talmud* adds that the installation of new public water infrastructure and reservoirs is allowed on certain holidays (Babylonian *Talmud*, *Moed Katan* D).

Beginning in the Roman period in Israel, the water supply to several cities became based on a system of long-distance transport of water. The systems included water collection systems and delivery within the cities. Construction and maintenance of the system was under the authority of the city. The wealthy city residents received water piped right into their homes, and were charged a special fee for this. These arrangements reflected the water supply rules applied in Rome and the other cities of the Roman Empire (Hirschfeld 1989).

While travellers had no legal right to use public waterholes, accepted custom required providing them access (Isaiah 21:14). The people of Amon and Moab did not follow this custom, and the *Torah* therefore forbade marrying them, even if they converted to Judaism (Deuteronomy 23:4–5). In ancient times private citizens or representatives of a community would frequently dig waterholes meant for the usage of travellers (*Baba Kama* 50a). The right of travellers to these waters was for immediate drinking needs only, and they were not allowed to fill containers to take for themselves or for others. During the Roman period, travellers were allowed to drink from the waters that were piped to the towns and cities (*Tosefta Eiruvin* 9:23, 11; *Tractate Avodah Zarah* 6:6).

4.3.4.2 Water Rights Between Communities

The *Talmud* generally adopts a system of water management that gives the parties closer to a water source priority over those further away and upstream riparians priority over lower riparians. When public springs are located within a city, the essential needs of its citizens come first, followed by the needs of the citizens of other cities (Babylonian *Talmud*, *Tractate Nedarim* 80b). Next comes the need of the animals (first the home city, then the other cities), followed by laundry usage and then agriculture in the same order. The dissenting opinion of Rabbi Yossi permits the upstream city to keep the water at the expense of the downstream community (Eisenberg 2001). In prioritizing agricultural usage, Jewish law developed a system whereby farmers closer to a water source generally had first rights to use it (*Mishna Gittin* 5:8; Babylonian *Talmud* 59b). This applied to springs, to waterholes, and to rivers. But the courts generally did not determine the order of priority for using a source of water for agricultural purposes (*Mishna Gittin* 5:8; Babylonian *Talmud* Babylonian *Talmud* 60b; Jackson 2006).

4.4 Water Quality and Protection

Of serious concern to Jewish government authorities in ancient times was preventing the pollution of water sources, especially due to the shortage of water in certain areas and times of year. The concerns were expressed in rituals, rules and legal decisions regarding water usage.

4.4.1 Rituals and Rules Regarding Water Usage

Awareness and importance of water quality and the dangers of drinking polluted water appear from the very early periods of Jewish history. This awareness received *Halachic* validity in different regulations that forbid drinking water of questionable health standards. Scholars related to these rules as life saving (*pikuach nefesh*), and thus received higher validity in comparison to other rules. This sensitivity characterized the Jews when they lived amongst non-Jews who did not have the same customs. Problems of water quality were first recorded in the exodus of the Jews from Egypt (Exodus 15:22–25). They arrived at a water reservoir, only to find the water unfit for drinking due to its bitter taste. According to the *Torah*, God ordered Moses to throw a stick into the water, whereupon the waters became drinkable. *Torah* commentators reflect that God taught Moses to ‘desalinate’ the bitter waters using natural methods.

Apparently certain shrubs had natural sweetening properties when placed in a water source. In his nineteenth century interpretation of the *Torah*, the Italian scholar Shmuel David Lutzato described a tree along the shore that sweetens

bitter waters. The book of Kings tells of a situation where the water supply was unsuitable for drinking. In this case, the water had no undesirable taste, but was of poor quality. Here Elisha ordered salt to be added to the water to make it drinkable (Kings II 2:19–22).

The laws forbidding pollution of water sources are based on two major Jewish principles. The first forbids wanton destruction (*Bal Tashhit*), and the second forbids damaging the property of another (Rambam's *Hilkhot Shkenim*, the Laws of the Neighbours). The first principle includes damage to public property and property that belongs to no one, like streams and springs (Rambam, *Mishne Torah*, *Halakhat Malachim* 6:10). In modern Israel, this would cover all water sources, since the Water Law declares all water sources as belonging to the people of Israel (The Water Law of 1959, 13 L.S.I. 173: arts. 1, 9). It should be noted that this principle falls within the category of laws that cover the relationship between a person and God, and not criminal laws governing behaviour within society.

Jewish tort and criminal law prohibit harm to private or public property. A violation of this principle can result in damages, including punitive damages. This principle would obviously cover direct damage to water, for example sewage flowing directly into a river or stream. Indirect damage, for example irrigation runoff containing harmful chemicals, is generally judged in a case-by-case manner. Would this apply to the digging of a cesspit in the vicinity of a neighbour's waterhole? The general rule of thumb according to the *halachah* requires a 50 cm distance for a cesspit from another use, but this would endanger the water quality of the waterhole (*Baba Batra* 2a). The *Gemara* commentary (*Baba Batra* 2a:17) adds that the 50 cm distance does not include a 50 cm wall thickness requirement, thus making the distance a metre in total. Jewish sages later declared that a cesspit must be placed far enough away to ensure that no sewage will seep into the drinking water supply of another, even if this requires a 10 m safety distance. They added that in this situation, the statute of limitations would not apply. Drinking water pollution is a serious harm and the *halacha* does not justify claims of time limitations in such cases (The Answers of the Sages, *Shaarei Tzedek*, §4, 1:15; *Beit Habechira Babba Batra* 19b).

The most discussed water pollution problem in Jewish law was water left unprotected, due to fear of snake poison (e.g., *Mishna*, *Tractate Trumot* 8:4). Apparently the fear of snake poison was in reality a fear that the water was unhygienic. The fear of snake poison was unique to the Jews, and the *Talmud* tells of Rav, a *Talmudic* scholar, who would not drink from the homes of non-Jews because they were not careful to watch over their water. On the other hand, Shmuel, also a *Talmudic* sage, did drink from non-Jewish homes, reasoning that while they are not fearful of snake poison, they are still careful to cover their water to protect them from trash and other foreign substances (Babylonian *Talmud*, *Tractate Avodah Zara* 30a). It was also forbidden to use unprotected water for bathing, mixing cement, and watering cattle (Jerusalem *Talmud*, *Tractate Trumot* 7:14; Babylonian *Talmud Avodah Zarah* 30b). In modern times, Jewish law commentators question the need to enforce this rule, since nowadays snakes are seldom found in the vicinity of homes and water supplies.

The *Talmud* forbids drinking water if for any reason there is fear it contains insects or other pests. *Halachic* scholars declared that water should not be consumed without a visual examination to ensure it is pest-free (Babylonian *Talmud*, *Tractate Avodah Zarah* 12b). The rules forbidding drinking straight from a water pipe or from a river or pond without examination can be explained as deriving from this fear (Babylonian *Talmud*, *Tractate Avodah Zarah* 12a, 12b).

There are cases where *halachic* scholars demand water of a higher quality than that supplied by local authorities. This problem arose in a nineteenth century correspondence between the newly appointed Rabbi of Zvinikradka and Rabbi Naftali Zvi Yehuda Berlin, known as the Netsiv from Wolozhyn (Gerstenfeld 1998: 27–28). The rabbi found that the local Jews would not drink the local river water because they had found a few organisms in it. The owner of the only two good wells, which were far away, charged exorbitant prices for his water. The people often went thirsty. The rabbi himself had examined the water and found no organisms in it. The Netziv's careful reply reflects an awareness of pollution problems and the scientific method. He advises taking water samples at different places and at different times of the year, because organisms develop only at certain temperatures. He also advised sampling water within the city, since the source of pollution may be there. If none of these tests show any organisms, then the river water may be drunk (*Teshuvot Meishiv Davar* 2:28). A similar problem arose recently in New York City, where a tiny harmless (and dead) crustacean called a copepod was found in the water supply. The creatures could be observed with the naked eye. Some rabbis declared the city's water unkosher and thus unfit for drinking without filtering (Brick 2004; Wye 1998).

Judaism requires purification of the human body at certain times by immersion in water that is not drawn or pumped. Because access to springs, rivers, and other natural bodies of water are not generally possible for city dwellers, most people were immersed in a place where rainwater was collected, called a *mikve* or ritual bath. In Israel, where long periods elapse without rains to replenish and flush out these pools, the waters often stood for long periods. Needless to say, the health standards of these waters (not to mention the smell) required a good shower after purification. Today, the Israeli Ministry of Health has promulgated regulations that include hygiene standards for ritual baths, which are required to maintain water quality (including clarity and smell) identical to drinking water (Licensing of Businesses Regulations (Health Standards for Ritual Baths), 1999). Jewish law also requires every person to wash his hands before eating. This regulation derives from the laws of purity and impurity, as well as for reasons of hygiene. Not all water is acceptable for fulfilling this requirement. They must be without odour, a requirement not found for the waters of the ritual baths, where the water's spiritual (rather than hygienic) qualities were what counted.

One method of maintaining water quality in biblical times was by categorizing permitted uses for various types of water bodies. Caves containing water were generally used for immersing and washing, and therefore using them to wash off impurities like faeces was forbidden due to the possible health hazards. Waterholes meant for supplying drinking water could not be used for washing, even a clean object. The responsibility for cleaning public ritual baths was the responsibility of the public representatives—the *beit din* (*Tractate Shekalim* 1:1).

4.4.2 Case Law on Water Pollution

The *Shulkhan Arukh* lists a number of water-related nuisance cases concerning nuisance to one's neighbour. If one neighbour has the right to let the rainwater from his roof run onto the land of another neighbour, this does not give him the right to let more noxious water run onto his neighbour's land (Gerstenfeld 1998: 119–20). The *Shulkhan Arukh* states that a community can prevent a citizen from setting up his gutter pipes in such a way that the water from his roof is conducted into the public domain (Quint 1994, 5: 105). A *responsum*, or a learned answer to a query of a legal or religious nature put to him in writing, by Rosh (Rabbenu Asher) refers to a case where a person has dug a well in his courtyard for collecting and storing rainwater. A lot of water has collected and overflowed into a neighbour's cellar, making the courtyard stink. Rosh decides that the owner of the well has to repair it and pay for the damage caused (*Rosh Responsa* 108:10).

A sixteenth century *responsum* from Rabbi Shlomo Cohen refers to the case of a person living on the upper floor of a house; the pipe from his toilet descends through the wall of an apartment below, and from there the effluent flows into a ditch. A neighbour who buys the lower apartment wishes to close the pipe, claiming that he suffers from the smell. The rabbinical decision is that he has no right to close the pipe because it has been there for many years; the pipe is unbroken and the ditch is covered; neither is the smell very strong or continual (*Responsa Maharschach* 2:183). In a modern day question, a rabbi was asked to rule on a complaint of one agricultural settlement against another. The use of sewage for irrigation was causing a strong odour, annoying the residents of the former settlement. The latter claimed that stopping the irrigation would cause economic loss. The rabbi decided that due to the potential economic loss, the irrigation may continue, but should be done in a manner which minimizes the nuisance (Rabinowitsch 1986).

4.5 Conclusion

There is no single orderly set of Jewish laws, nor a single set of Jewish water laws. Jewish law is based on the *Torah*, which cannot be changed or amended. It develops through additional interpretations of the *Torah* (or interpretations of interpretations of the *Torah*) made by the rabbis and scholars of the day. The saying 'two Jews, three opinions' applies to Jewish law interpretations as well. Jewish water law began as rules concerned with water usage in the biblical land of Israel, both on a national and regional level, as well as on a personal level. Later when the Jews were exiled from Israel, Jewish water law continued to develop, but mainly on a personal level.

Jewish law has legal status in modern Israel chiefly for matters of marriage and divorce, which comes under the authority of the Rabbinic courts (alongside Islamic, Christian, and Druse courts). In other matters where Israeli law is silent, Jewish law can be referred to as one of several sources of legal 'insight' (Law of Legal Foundations—*Hok Yesodot Hamishpat* 1980). Jewish law is still adhered to by the

religious Jewish community both in Israel and the world, chiefly through regulating personal behaviour. But it may not supersede local law.

Modern Israeli water law has little relation to Jewish water law (see Chapter 6, this book). But because both have their roots in the same land, with the same climate and the same limited water sources, both developed laws in an attempt to assure proper prioritization and the protection of water sources. Water law in biblical Israel required sustainable management of the water sources. There was not much choice, since water stored in cisterns could last from one rainy season to the next, but not much beyond that. Any water source, whether a spring, river or well was revered and protected. Israel's Water Law of 1959 also based the supply of water on the sustainability factor, without any long-term guarantees as to the amount of water to be supplied beyond essential needs.

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Part II
Evolving National Law and Politics

Chapter 5
Brazil: The Evolution of the Law and Politics of Water

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Absract Brazil's natural beauties were exploited during and after Portuguese colonization as if they were infinite. Red dyewood deforestation gave a name to the country ('pau brasil'). Non-sustainable economic activities of the colonial era, including sugar cane production, cattle ranching and mining, overused the land and water resources. After independence, deforestation continued, justified by narrow economic perspectives, resulting in increasing destruction of Brazilian ecosystems. More recently, this destruction stimulated contemporary preservationist impulses such as expressed in the National Water Act of 1997. Today, institutions aim to balance the economic and ecological values of water in a developing country that relies heavily on hydropower and irrigation. Water is now treated as a finite natural resource that must be managed through river basin committees to develop a balance between human consumption and ecosystem needs.

Keywords Brazil • ecocentric view • ecological flow • environment • hydropower institutions • water basin management

5.1 Introduction

This chapter analyses the social, economic, cultural, and political processes that have evolved in Brazil from an anthropocentric view (with emphasis on irrigation, navigation, and hydropower) to an ecocentric view that aims to integrate water use with environmental protection. The colonial period emphasized navigation, the republican period emphasized energy, with water categorized as public, private, or common according to their use by humans. An ecological view of water management emerged in the 1981 National Environmental Policy Act, the 1988 Federal

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Constitution, and the 1992 Earth Summit in Rio de Janeiro. This shift embodies a complex value conflict between economic and ecological goals, especially sensitive within a developing country context. The challenge to balance the economic and the ecological value of water in a developing country are great. This chapter provides a historical background, discusses the evolving ecocentric view and addresses the challenges in regulating hydropower projects, before drawing some conclusions.

5.2 The Background of Brazilian Water Law

The roots of Brazilian water policy can be traced back to the contrasting views of Native Brazilians to whom nature was connected with their existence and the Portuguese colonizers for whom nature was just a raw material with economic value.

5.2.1 Native Brazilians and Harmony with the Land Before Colonization

When Brazil was discovered by the Portuguese navigator Pedro Alvarez Cabral, around one million Tupinambas (Tupi-speaking people) lived along the Brazilian coast in villages of between 300 and 1,000 residents (Wagley 1963: 15). Each village was economically self-sufficient and lived within the rhythm of tradition and fidelity to the land (Gomes 2000: 29). They used wild plants sustainably, experimenting with wild species and bringing many (e.g., palms, nuts and fruits) under partial domestication (Steward & Faron 1959: 47). These developments still influence current production (Wagley 1963: 56). The Native Brazilian cultures contributed to today's growing conservation movement, both as a model and because of the conservation and protection of Indian lands, which constitute around 12% of the country (Valenta 2003: 643–44). The Tupinambas lived in communities of a single lineage largely concentrated along the rivers because of the abundant fish. They also hunted and grew crops (Steward & Faron 1959: 294). The rivers also allowed easy transportation (Steward & Faron 1959: 292). These patterns still influence current production (Wagley 1963: 62).

5.2.2 Colonization Introduces the Roman Law Tradition

The Portuguese arrived in 1500 and exploited the land, wood, and people for economic gain (Gomes 2000: 36). Gradually local and imported labour was organized to allow for the production of sugarcane, cattle, gold, and coffee (Williamson 1992: 183). Native Americans largely disappeared from the coast and were soon replaced by African slaves (Fausto 1999: 17). After some experiments, the

Portuguese government settled on mercantilist policies to strengthen its national economy through monopolizing the purchase of spices and raw materials from the colony and the import of products exclusively on the colonizers ships (Dewitt 2002: 71; Lockhart & Schwartz 1983: 184–91).

The Portuguese brought the civil law tradition with them. This tradition traces back to Emperor Justinian's compilation of Roman law in the sixth century—the *Corpus Iuris Civilis* (Farias 2005: 367). Justinian's Code consolidates Roman water law principles: water is variously characterized as a public commodity (*res publicae*), a thing common to everyone (*res communis omnium*), or a private commodity (*res singulorum*), depending on the circumstances of its flow (Pompeu 1972: 160–62). Because the civil law tradition emphasizes legislation, to study the evolution of water law in a civil law country is to study the changes in the constitutions, codes and statutes related with water and environment in Brazil. The idea of rivers as streams for all (water as *res communis omnium*), therefore, evolves from the civil law tradition. Water in large streams belongs to the public for use by fishermen and for navigation, while riparian landowners are allowed to make a reasonable use of water in the stream as long as navigation and fishery are not injured. Water in smaller streams was held in common by the riparian owners, while water that was confined to a single owner's land was the private property of the landowner.

The basic rules for the Portuguese nation and its colonies were established through the Ordinances of the Kingdom, named after the King that promulgated them: the Afonsine Ordinance (King Afonso Henrique); the Manueline Ordinance (King Manuel); and the Filipine Ordinance (King Felipe II). Under the *Ordenações Filipinas* (Filipine Ordinance), the navigable rivers belonged to the Portuguese Crown, and thus the use of water streams depended on royal permits (Livro II, Título 26, ¶8). A reaction against this Portuguese rule brought exceptions in a new statute, the *Alvará* of 1804, in which the Brazilian colony granted rights of free use (without permit) for riparian owners and cities (*Alvará de* 27/11/1804, ¶¶11, 12). With independence, the royal rights were transferred to the Government on behalf of the people; the current permission requirement for water use (*Lei do Plano Nacional de Recursos Hídricos* [National Water Act] (1997): arts. 12, 13) has its roots in the feudal Portuguese Ordinances. Thus, in the Brazilian Civil Code of 1916, water was classified as a public good belonging to the Federal, State, or Local Government when used for all people or as private if it did not belong to the Government (*Código Civil* 1916: art. 81).

5.2.3 Regional Diversity and Economic Activity During the Colonial Period

Different regions developed differently and made different demands on water resources. The north-eastern coast concentrated on sugarcane production (Normano 1935: 19; Prado Júnior 1967: 4). For the production of sugar, water-mills were very important. While water-driven mills were more efficient than animal-driven mills, they were

expensive and difficult to establish. Because of the rapid deterioration of land under sugarcane cultivation and the high cost (slaves, oxen, and oxcarts) of transportation, any *engenho* (sugar estate) would have had a limited radius from which it could have profitably received cane. Gradually, animal and water driven mills were replaced by steam-powered mills. The first steam mill was installed in Bahia in 1815, and another in Pernambuco in 1819, but steam mills were expensive. In 1857, only 18 of the 1,106 sugar mills in Pernambuco were steam-driven, while 346 were water-driven, and the others were powered by animals. Production increases were due to the installation of steam mills and central sugar factories (*usinas*), rather than to extension of the cane fields. *Usinas* first appeared in Pernambuco in the 1880s; they depended as much on railroads as on advanced sugar-processing technology (Prado Júnior 1967: 29).

The export-oriented sugar industry helped to implement inefficient land use in Brazil. Colonial land policy (donatary captaincy) and sugar monoculture favoured large grants to a few well-placed families, leaving the overwhelming majority of lands idle, badly utilized, and underutilized, or simply held for speculation and reserve wealth. The north-eastern sugar economy from 1570 to 1810 undergirded the strong interest in the economic value of water as a source of energy (hydraulic power) in current Brazilian water law. In modern times, lack of water has stalked the Brazilian north-east, a region often described in terms of persistent poverty and resistance to change. North-easterners see their aridity as a cause and symbol of their region's relative underdevelopment and claim that this reflects a long-standing pattern of government favouritism towards the south (Greenfield 1999).

The priority use of water for watering animals in current Brazilian water law (*Política Nacional de Recursos Hídricos* [National Water Act] 1994), has its historical roots in the economic activity of cattle raising—the initial focus of activity along the south-eastern coast. Rivers contained freshwater for cattle ranches and for small farms producing subsistence crops, primarily maize and manioc (Levine & Crocitti 1999: 4). Moreover, in Brazil (especially the centre-west), for generations, the river was the easiest way to go into the interior of the country, and therefore, the route of settlers (Morse 1958: 13).

In Brazil, gold and cattle lured the frontiersmen on to seek new lands. In the seventeenth century, Brazil was the largest supplier of sugar in the world before losing out to the West Indies. In the eighteenth century, gold from the south-western region became the mainstay of the Brazilian economy (Normano 1935: 18). Gold led to the overnight development of villages and towns along rivers in remote regions of Minas Gerais and from these primitive mining camps arose the opulent cities of Marianna, Villa Rica de Ouro Preto, and São João d'El Rei (Normano 1935: 29).

The activities of the first English Company in Brazilian gold production, the St. John D'El Rey Mining Company, demonstrate, beginning in 1824, a good picture of the importance of water to the gold rush. Lack of coal and the expense of burning wood for steam power ruled out steam engines, while the abundance of water made possible the hydraulic and hydroelectric power that enabled the mine to exist and expand, not to mention providing a cheap industrial solvent. By the 1930s, the St. John used about two million gallons of water per day. Low rainfall slowed production. 'Water [truly] became the lifeblood of gold operations' (Eakin 1989: 122).

5.2.4 Modernization in Brazil

Establishment of the Republic and the abolition of slavery in 1889 launched the modernization process in Brazil. Unlimited horizons and inadequate attention to environmental costs resulted in policy disasters such as the expansion of subsidized cattle raising (Andersen et al. 2002: 72), Amazonian hydroelectric generation, with immense reservoirs necessary to compensate for the relatively flat terrain, flooded out indigenous groups and diverse tropical biomes, destroying tropical forests and biodiversity (Jepson 2005). Native Brazilians continue to resist violently incursions by prospectors and other intruders into recent times (Rabben 2002). The Northeastern Brazil Integration Development Program (*POLONOROESTE*) launched a land settlement scheme in Rondonia and Mato Grosso that also prompted international debate over deforestation and soil degradation from farming, subsidized cattle ranching, mining, and lumber mills (May 1999).

Seven historical trade cycles have prompted deforestation (Brazil wood, sugarcane, livestock, gold, coffee, rubber and steel) and urban expansion from the early nineteenth century developed its own deforestation dynamic (Costa 2003: 75). In Rio de Janeiro, for instance, where sugar had caused the deforestation of tropical flatlands, urban sprawl shifted pressures to the cooler hills. The growing urban population, with its demand for food crops and for wood products (firewood for cooking and factories, charcoal, construction poles, ship-building, mangrove bark for hide tanning, etc.) pressured the surrounding Atlantic forest. Today, more than 92 cities have a population greater than 100,000, putting enormous burdens on urban water services (Meade 2004: 232).

5.2.5 The Water Code of 1934

Water law in Republican Brazil can be organized into the Economic Period, ushered in with the Water Code of 1934, and the Ecological Period, with adoption of the National Environmental Policy Act in 1981, the new Federal Constitution in 1988, the Rio Earth Summit of 1992, and the National Water Act of 1997. The Water Code of 1934 (*Código de Águas* [Water Code] 1934) was the first of a set of natural resources codes that viewed nature as a commodity. The Water Code regulated water use for agricultural and industrial purposes, including hydroelectric power.

A gradual industrialization had begun in Brazil in 1914 with the beginning of World War I, spurred on by the undemocratic government of Getúlio Vargas (President, 1930–1954) (Loewenstein 1942). Some regulations from this period lasted until the 1967 reforms, others until the 1988 Constitution. The Water Code was designed to promote the hydroelectric power sector and the role of the public and private sectors in providing energy, as well as to regulate agriculture and industry generally (Water Code 1934: Livro III). The Code classified water resources as public, common, and private (arts. 1–8).

Waters were public except when they were entirely inside a private property. Springs and waters found entirely within a private property were private if they did not give rise to common waters or public waters. Smaller streams were deemed common waters to be shared by the riparian owners. For most waters, water was disassociated from land and treated as 'national patrimony' to be exploited through specific concessions' (Drummond & Barros-Platiau 2006: 87). Public rivers were the property of the Federal and State governments according to the rivers' extent and state frontiers. The Code did allow usufructuary rights in public waters in conformity with administrative regulations (arts. 36, 46).

5.3 Democracy, Decentralization, Sustainability

Although the Water Code was innovative at the time, including the 'polluter-pays' principle (arts. 110–116), it ignored the ecological perspective. Growing water pollution in urban and industrialized regions with serious health impacts led to the development of new ecocentric laws and institutions (Meade 2004: 232).

5.3.1 The Ecological Era of Water Policy

The first state pollution agency was created in the state of São Paulo to deal with water scarcity, thermal inversions, and the absence of industrial control in a region characterized by industrial concentration. At the federal level, a national institution to protect the environment was created partly as an answer to the 1972 United Nations Conference on the Human Environment. A special agency was created, attached to the Presidential Office, the *Secretaria Especial de Meio Ambiente*—SEMA (Drummond & Barros-Platiau 2006: 91–92).

The current National Environmental Policy Act (*Lei Federal da Política Nacional do Meio Ambiente*) was enacted in 1981. This Act recognized for the first time the ecological value of water (art. 2(II)). It was drafted mostly by the SEMA staff and became Brazil's 'cornerstone environmental regulation' (Drummond & Barros-Platiau 2006: 91–92). The 1981 statute created environmental institutions at the beginning of the Brazilian democratization process. They are, therefore, not as authoritarian and centralized as most of the former Brazilian agencies. The National Environmental System, an encompassing management network, was conceived to share responsibilities among the three spheres of government: federal, state, and local. Nationally, the system is managed by a national agency, with its staff, regional offices, and a Council. The federal model was adopted in several states. The Councils have a democratic structure, differentiating the Council from the rest of Brazilian public administration. The National Environmental Council, for example, is composed of 47 members representing government agencies, environmental groups, and industry associations (CONAMA 2006).

In 1987, the democratically elected National Constitutional Assembly created a new constitution that symbolized the consolidation of the ecological period and the beginning of democracy and participatory environmental management. Thus, the 1988 Federal Constitution includes an 'environmental' chapter on the basis of which the federal government created the country's major executive environmental agency—the Institute of Environment and Renewable Natural Resources. The Council decides democratically on rules to protect the environment and to achieve sustainability.

The 1992 Earth Summit, which took place in Brazil, produced the *Rio Declaration on Environment and Development*. The declaration consists of 27 principles to guide nations towards greater environmental sustainability (Rio Declaration 1992). The same conference adopted Agenda 21, a comprehensive blue print for local, national, regional, and global actions to achieve sustainability. The conference also approved the Convention on Climate Change and the Convention on Biodiversity. At the end of the 1990s, a new set of statutes was enacted to enforce Brazil's international environmental commitments at the Rio Conference, including a new National Water Act (*Lei do Plano Nacional de Recursos Hídricos* [National Water Act] 1997), for whose implementation the National Water Agency was created in 2000. These laws signalled a departure from the 1934 Code's vision of water as an inexhaustible resource oriented for anthropocentric demand, instead adopting an ecological approach for managing water use. Today, under the Ministry of the Environment, the National System of Water Management consists of the National Water Agency, the State Water Councils, and Hydrographic Basin Committees, designed to implement the ecological era of Brazilian water policy.

5.3.2 Public Participation, Cooperative Federalism, and River Basin Management

Following the overthrow of democracy in 1964, the army and police used torture and imprisonment to suppress resistance against the military regime until 1976. This period of dictatorship impressed itself in the Brazilian people's conscience. In 1982, millions took to the streets to demand elections, leading to the restoration of democracy in 1985. During military rule, decision-making processes were centralized in the Federal government. The return to democracy led to a new model of cooperative federation in which states and local governments have responsibilities in the management of water basins. The current Brazilian Constitution and National Water Act define a democratic paradigm of integrated and decentralized management of water resources.

The crisis of the former military regime and the increase of disputes related to the allocation of water to different uses and growing concern with environmental quality caused a legal shift towards river basin management. During the 1990s, several Brazilian states and the federal government passed legislation mandating a reorganization of the country's water management system. The new framework created inclusive decision-making committees to oversee management of water resources at the river basin level. São Paulo was the first state to improve river

basin water resources management policy, promulgating state regulations to integrate management of water resources (*Lei Estadual de São Paulo* [São Paulo State Statute] 1991). Other states followed in the early 1990s.

Operational barriers remain. Population expansion has caused cities and their auxiliary services, as well as state sanitation companies, to try to cope by supplying water with no thought given to resource exhaustion. Who is responsible for such exhaustion in each state has not yet been resolved. This management model requires the participation of civil society (the social-democratic element) to address peacefully the ecological allocation of water (the ecological element) and cooperation among the different parts of the Brazilian Federation (the political-federation element) in order to find a more efficient political institutional arrangement.

5.3.3 The Ecocentric Aspects of Environmental and Water Law

The main objective of water management is optimum water allocation to uses, yet controversy continues over the criteria for allocation. For centuries, political theorists assumed that humans are the primary, if not the only, beings of value in the material world, with the surrounding, non-human world valuable only insofar as it serves human purposes. Recently, environmentalists have challenged this human-centred approach to promote an ecocentric approach (Eckersley 1992: 1–2; Farias 2005: 101–51). Under this approach, the managerial framework must be tailored to the situations and constraints facing particular regions with different biomes.

The ecocentric approach in the Brazilian water allocation system is embedded in the 1988 Constitution's National Water Resources Management System within flexible federal regulation of the environment. The Constitution defines water as a public good, ending the private water system of the 1934 Water Code. As a public good, the Federal or State government administers water, according to the geographic and ecological circumstances of the river basin. Rivers entirely within a state are administered by the state (*Constituição Federal* [Federal Constitution] 1988: art. 20(III)). Rivers flowing through several states, or those forming a border between states, are administered by the federal government, although tributaries may be administrated by the different states (*Constituição Federal* [Federal Constitution] 1988: art. 26(I)). Water management at the river basin scale therefore depends on the cooperation of the state and federal governments. Environmental protection is shared by the federal, state and local governments, requiring that local governments also share in the management of watercourses. And, with the adoption of the new constitution, participatory planning for a National System began throughout the country led by the Brazilian Water Resources Association (Porto & Kelman 2000: 251–52).

Managing water as an ecological good requires a normative system within an adequate institutional and legal framework. Powerful international actors have provided important political support to the institutional change and the new

normative system (Keck & Abers 2004: 32). The next subsections examine the resulting normative system.

5.3.4 *Water as a Public Property with Economic Value (the Substantive Norm)*

The National Water Act specified several guidelines for implementing the ecocentric view of water management: It treats water as public property and a limited natural resource, valuing its multiple uses and highlighting the use of water for human and animal consumption as an absolute priority in times of shortage (art. 1(III)). Water has characteristics that make involvement of the public sector in its management more essential than for other resources that can be handled efficiently in a market (Dellapenna 2000: 326–35). But there is no single objective to a public water allocation mechanism. Public allocation in Brazil promotes equity objectives, such as ensuring water supply to areas of scarcity (the north-east region), protecting the poor, and sustaining environmental needs.

Fundamental to the rationalization of water management is treating water as an economic good, for the use or harm of which its users should pay. Major water users—industries, sanitation companies, electric companies, irrigators—pay for both the quantity of water they use and their polluting discharges. This is not a commoditization or privatization of water. Brazil has resisted pressures to establish markets for water rights. Ownership of freshwater remains public; costs are a mechanism to regulate supply and demand within the jurisdiction of each river basin and to fund improvement projects within the basin.

5.3.5 *The Integrated Participatory Model (the Procedural Norm)*

As important as the substantive norms, the Brazilian procedural norm of full participation by local communities in water policy decision is even more important to implementing the ecocentric guidelines of the 1997 National Water Act. Public involvement at river basin level was seen as an indispensable condition for social, economic and ecological sustainability (Galloway 1997; McDonald & Kay 1988). The old paradigm of management solely by the government in the north-east had resulted in waste and unfair allocation of scarce water since the start of sugarcane production. Lobbying to meet the interests of few powerful politicians for the construction of new reservoirs with federal money is ‘drought political malpractice’ (Kelman 1994: 83). The new paradigm of participatory water management directly engages citizens to engage in self-rule. Each river basin committee is formed by representatives of water users (riparian and non-riparian) and representatives of federal and state governments. Members of Brazilian River Committees are

not legal professionals, but water users appointed by their fellows to solve local problems. A river basin agency serves as the executive office for the watershed, providing technical support to local management of water resources.

River basin management allows flexibility to adapt water use patterns to local needs. Because those directly involved in water use—either for agriculture, home consumption, or industry—have more information on local conditions than the agency staff, they do not need to rely on rigid formulas for allocation. User organizations can take into account local needs for watering animals, washing clothes, bathing, or small enterprises—needs that a sectoral agency has no mandate to meet—leading to improvements in output per unit water, or in equity, or both. Additionally, user-based management enhances political acceptability (Eckersley 2000; Farias 2005: 407–10).

The National Water Act specified tools to implement these principles, including water resources plans, water classification schemes, water use rates, and water resource information systems (art. 5). An ecologically sensitive approach recognizes that the multiple uses of water require a balance between the ecological and economic use of water at an appropriate scale—the river basin (Drummond & Barros-Platiau 2006: 98). The multiple use of water emphasizes treating water as a collective good, instead of something designed to appease individual and particular interests. Thus, the institution of the National System of Water Management classifies water bodies in order to establish the priorities for its use (art. 22). The Amazon River, for example, must be used more for ecological purposes than for economic purposes. Complementing the basin management approach, Brazil's enactment of an environmental impact statement requirement improves public participation in water management (*Lei Federal da Política Nacional do Meio Ambiente* [National Environmental Policy Act] 1981). It ensures access to information, the opportunity to be heard, transparency in decision-making, and mechanisms for implementation and enforcement. The environmental impact report that emerges from this process should describe the activity and the existing environment, explain the purpose and need for the proposed activity, consider reasonable alternatives (including doing nothing), and assess the environmental impacts of the project and its alternatives. The effectiveness of environmental impact assessment in Brazil, a developing country, is influenced by its political and economic philosophy, as well as the limited resources available for the process (Modak & Biswas 1999: 52).

5.3.6 Water Conflicts on a River Basin Scale: The São Francisco River Basin Committee Case

The São Francisco river basin provides a good example of the basin management process. The basin covers an area of almost 634,000 km^2, draining areas of Minas Gerais, Goias, Bahia, Pernambuco, Alagoas, and Sergipe, as well as part of the Federal District. The river is nearly 2,900 km long, with an annual average flow of 3,000 m^3 per second, providing roughly two thirds of the freshwater available

in semi-arid north-eastern Brazil (Costa 2003: 16). The river basin is marked by socio-economic disparities and environmental vulnerabilities. With a population of approximately 13.3 million inhabitants (year 2000), about 7.5% of the Brazilian population, the basin has enormous potential for economic growth.

Intense economic activity exerts pressure on water resources, particularly with 340,000 ha irrigated (with a potential estimated at 800,000 ha) and areas affected by pollution. Another area of great concern is the impact of hydroelectric and other dams on the hydrological processes and geomorphology of the river—and the cascade of consequences these changes impose on the estuary, coastline, and the marine environment. The optimization and harmonization of various water uses—generation of electricity, shipping, irrigation, fishing, tourism and leisure, dilution of wastes, household and industrial water supply, mining, environmental needs, and others—has been a constant challenge. In weighing alternative courses of action, such as to improve river flows (the ecocentric option) or to increase the irrigated area for crop production (the anthropocentric option), the River Basin Committee must respect the National Water Act and what seems more important for the majority of the members. Hence, the selection of members for the River Basin Committee should cover the diverse social, political, economic and environmental characteristics of its stakeholders in order to handle these water conflicts.

5.4 Challenges in Balancing Economic and Ecological Values

Seeking to balance the economic and ecological value of water in a developing country is a hard task. This section illustrates the problem by considering the importance of water for the production of energy in Brazil, the negative effects for the river basin, the role of Native Brazilians and rubber tappers in the protection of the Amazon biome, and the case of dam construction inside the Amazon Basin.

5.4.1 Water, Energy and Development

Brazil definitely was not an environmentalist society for most of its industrialization period; it was a pro-development society (Drummond & Barros-Platiau 2006: 84). The importance of rivers for development has resulted in first-rate university programmes in engineering and related scientific fields, primarily focused on hydroelectric power (Keck & Abers 2004: 29). In the 1934 Water Code, hydraulic energy use was primary and other uses were secondary (Water Code 1934: art. 143). Today, electrical energy represents nearly 40% of the total energy consumption in Brazil and hydroelectricity provides 70% of its electric power. (Braga et al. 1998: 129–30). Until recently, thermal generation was utilized for isolated systems and in a complimentary way. The 1988 Brazilian Constitution vests the Federal Government

with authority over exploration, directly or by concession, authorization, or permission, of the hydropower potential of watercourses in cooperation with the states where those potential sites are located (Constitution 1988: art. 21(XII)(b)).

Drought in 2000 and 2001 led to acute power shortage as the nation's hydroelectric dams became unable to meet national demand. The result was a power rationing that included mandatory blackout of up to 4 h per day. The rationing was lifted after rains began refilling lakes, rivers, and reservoirs. The government announced a short-term plan to build 55 new thermoelectric plants by 2003 and a long-term plan for 8 new hydroelectric plants over 7 years (Buckman 2004: 83).

5.4.2 Hydropower and Ecological Impacts

The growing environmental awareness emphasizes the environmental costs of generating power. Hydropower traditionally has been considered a renewable way of generating energy that does not emit greenhouse gas emissions. Today, that view has changed. Reservoirs change the way significant amounts of vegetation rots and dramatically change the greenhouse effect of that rotting vegetation (Pearce 2006: 144). The reservoirs also have significant negative ecological impacts, including fundamental changes for the flooded land, evaporation rates, the morphology of the watercourse, the transport of sediment, levels of oxygenation, and the temperature of waters, all of which may affect riparian habitats and aquatic species, particularly during sensitive stages of the breeding cycle (Reid et al. 2005: 363–64).

Today, under the National Water Act, the use of water for the generation of electric power is subject to a government permit and must be described in the National Water Resources Plan (National Water Act 1997: art. 12). Another important mechanism to analyze the ecological impacts of hydropower plants in Brazil is the environmental impact statement (National Environmental Policy Act 1981: art. 9(III)). Procedures for environmental impact statement include public consultations and hearings in order to take into account the social, cultural, economic, and environmental concerns and values of the entities and citizens involved. Nevertheless, in general, the mechanism has not succeeded in resolving the complex social and political problems involved, especially in societies with a low level of organization and activism or a non-democratic government. Brazil has no historical tradition of public participation in the political/administrative decision-making processes on an institutional basis.

5.4.3 Forest Peoples and the Fight for Preservation in the Amazon Basin

The 1988 Constitution contains extensive definitions of 'Native Land,' requiring the demarcation of all indigenous territories by 1993 (Constitution 1988: art. 231(I)), yet by 1996 the Brazilian government issued a decree delaying the

demarcation of new reserves and impeding the indigenous rights guaranteed under the Constitution. The decree allows cities and non-Indians to challenge demarcation and suspend Indian property claims. The Yanomami are South America's largest unassimilated tribal group; the 20,000 remaining members of this group live in cleared sections of the rain forest, where they conduct their affairs according to long-standing communal principles (Early & Peters 2000; Meade 2004). Although the Yanomami secured some victories, by 2000 they had gained control of only a quarter of their original lands, which remain threatened by mining interests, politicians, and the military.

The current importance of Native Brazilians in the area of the Amazon Basin is unquestionable. Moreover, Indian customs and characteristics have penetrated deeply into Brazilian behaviour. Indian myths form a part of the Brazilian subconscious. In the Amazon, many names of places, rivers, animals, and popular expressions have been borrowed from Tupi-Guarani (Buarque de Holanda 1979: 88; da Silveira Bueno 1986: 509) and many Amazon peasants believe in Native American supernatural forces and call on medicine men (Wagley 1963: 59).

Besides, by the mid-1980s, rubber-tappers and native Brazilians, led by Chico Mendes, took the leadership in establishing a link between their struggle and ecological concerns, forming in late 1988, in the state of Acre, a coalition for the preservation of the Amazonian rain forest active under the name 'Forest Peoples Alliance', which was extended in early 1992 into the International Alliance of the Indigenous-Tribal Peoples of the Tropical Forests. Native Brazilians should be in charge of both the management and the control of the resources on which they depend. That same year, the Convention on Biological Diversity and Agenda 21 both expressly acknowledged the major role to be played by indigenous and local communities (da Cunha & de Almeida 2000: 315).

5.4.4 The Tucuruí and Xingu River Dams in the Rainforest

For some, the hypothesis of not using Amazonian hydropower implies the implementation of a significant thermoelectric programme for the country that would rely on oil, coal and, maybe, nuclear plants. This would certainly result in higher energy costs to the final consumers, severe air pollution at the local through to global scale, and the disposal of nuclear wastes. Thus the adequate planning of Amazonian hydropower plants, including economic, social and environmental variables, is considered the only feasible alternative for the long-term supply of electric energy in Brazil (Braga et al. 1998: 133). More than 50% of new hydropower potential is located in the Xingu River in the Amazon basin. Development of dams on the Xingu river basin is being given the highest priority (Braga et al. 1998: 131) and if this actually happens, the new hydropower will be installed in a highly environmentally sensitive region of the Amazon basin, a vast network of jungle, rivers, and trees, containing a yet unknown richness in biodiversity and

natural resources. Estimates vary, but most studies agree that this region contains at least one third of the world's biome of tropical moist forest and perhaps as much as two thirds of the world's freshwater is located in the Amazon basin (MaGee & Zimmerman 1990: 515).

The international environmental and political communities have heavily criticized the rapid deforestation of the Amazon basin. Traditionally, controversy surrounding the Amazon has stemmed from conflicting economic uses of the forest. Today the ecocentric approach motivates the critics. Brazil's policies in the past 30 years have been designed to stimulate economic growth, through adequate infrastructure (Klosek 1998: 126–27). The Brazilian government has spent billions of dollars building roads, hydroelectric dams, and other development projects designed to encourage settlement in the Amazon, including 'Operation Amazonia' in 1966 with special tax incentives encourage domestic and foreign investment in the Amazon region. This, aided by the World Bank, the Inter-American Development Bank, and the United States Agency for International Development, caused the clearing of the dense forest in what was perceived as the last great land grab on the planet.

Over the past 15 years, dams have come to define many elements of the landscape and power sources in the Amazon River. Large dams flood extensive tracts of forest and displace people and wildlife already living there. An example is the Tucuruí dam, which was built in the Brazilian Amazon region to serve the aluminium export industry, while the local population was deprived of its livelihood and suffered other negative effects of the project without compensation (La Rovere & Mendes 2000: xviii).

In 1975, Eletronorte, a state energy company, proposed the construction of several dams on the Xingu River. In 1980, Eletronorte carried out studies for the hydroelectric complex of Altamira, comprised of these two dams involving the flooding of 8,000 km^2 of land. The Conference of Indigenous Peoples of the Xingu, which met in 1988 in Altamira, united dozens of indigenous nations, who demanded that the Xingu River be freed of dams (de Castro 2005: 10). Since 1988, local activists (rubber-tappers, Indians and environmental NGOs) have paralyzed several attempts to construct dams in the Amazon region of Brazil due to their social, economic, and environmental impacts on local communities. Pressure from natives caused a temporary cancellation of loans from United States-based international development banks for projects in the Brazilian Amazon (Rich 1985: 734–35). The Altamira controversy, combined with other controversies over dams around the world, led the World Bank, for a time, to stop its financing of large dam projects. Belo Monte, on the Xingu River, was one of the projects in Brazil paralyzed by lack of funding. This process culminated in the Report of the World Commission on Dams in 2002 and the Johannesburg Summit in the same year, both of which opposed new large dams, although there have been some developments more favourable to large dams since.

Recently, the Altamira project was reformulated to include a complex of five hydroelectric dams with the potential to flood at least 100,000 people in three municipalities and 8,000 people in indigenous settlements. The proposed dam at the large turn of the Xingu would be Eletronorte's largest. The large turn is a mythical place filled with symbolism and significance to the peoples of the forest

(de Castro 2005: 10). The effects of the Xingu complex would be similar to those at the Tucuruí dam, the fourth largest hydroelectric dam in the world: changes in the water quality of the river and its tributaries, in the dynamics of waterfalls, and in the size of lakes, islands, and small waterways. The experience suggests that a state may not be the best protector of the interests of its residents when it comes to the construction of dams. All the interests need to be weighed, measures mitigating negative effects need to be developed, and where rights are violated these need to be compensated. When the World Bank or the like are involved, these organizations have a responsibility to hear the river basin committee to ensure the proper weighing of the interests affected by the project.

There is a gap between the legal and political system regarding the construction of dams in the Amazon River. The decision of hydropower plants must be made inside a river basin committee. It therefore is inconsistent with the National Water Act to make these decisions before the installation of the Amazon and Xingu River Basin Committees. The Brazilian institutions already have the know-how to create the Amazon Basin Committee; it will not be an institutional challenge as the São Francisco was.

5.5 Conclusions

In civil law countries such as Brazil, theory precedes practice. Despite the fact that Brazil has a rich and advanced water legislation, much remains to be done in terms of enforcement and compliance, especially in the case of development issues such as the construction of dams and the importance of the Amazon rainforest's preservation. Compliance remains a problem with so many still attached to the vision of nature as a raw material to be exploited for free, and thus not aware of the benefits of environmental conservation.

Since 1500 in Brazil, water resources have been allocated on the basis of economic exploitation. The Brazilian government has continued to elaborate statutes, such as the 1934 Water Code, that promote capital infrastructure and seek to maintain the allocation of water for the production of goods for the international market. The 1934 Water Code regulated the use of water in order to allow the expansion of hydropower. Only recently has increased understanding on how the environment affects the quality of life, led to environment-friendly policies for water allocation, such as in the 1988 Constitution and the 1997 National Water Act.

The sustainability of natural resources, and particularly of water, can evolve in Brazilian minds through the participatory model of water management. The important connection between substantive and procedural environmental rights was recognized in Principle 10 of the Rio Declaration on Environment and Development (1992), which stresses public participation as a precondition for sustainable development. Enhancing the capacity of institutions to promote participation, the National Water Act contributes to the public awareness of water and related environmental issues and enables these institutions to use these concerns for the decision-making process

of allocating water. The participation of river basin stakeholders in the conservation and management of natural resources seems to be increasing in Brazilian Water Policy Management. The example from the Forest Peoples in the Amazon Basin has shown the connection between public participation and water resources preservation.

Brazil will continue to depend on its hydropower resources for development. This situation requires careful decision-making in order to encompass economic, social, environmental and political concerns. There is no better place for this than in a river basin committee. River basin committees have provided an important mechanism for public involvement in water management, but conditions for its practical implementation are far from effective and meaningful. River basin decision-making is at a disadvantage because of the historical lack of public participation in Brazilian history. In order to improve ecocentric water management, it is important to invest more resources to raise the quality of environmental impact statements for hydropower dams and to improve the participation of non-governmental organizations in the committees, in order to increase the number of ecocentric, rather than anthropocentric, decisions.

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Chapter 6
South Africa: The Development of Water Law

Michael Kidd

Abstract This chapter traces the development of South African water law and policy from the beginning of European colonization in the mid seventeenth century to today. While the scarcity of water in South Africa warrants government control over rights allocation, for several centuries the law has instead been based on a riparian rights system, with the result that the majority of the population has had inadequate access to water. The onset of democracy in 1994 resulted in water law reform and a new water act that contains several innovative provisions. This chapter discusses the new water legislation and the challenges relating to its implementation.

Keywords Colonization • water law • pollution • riparian rights • South Africa

6.1 Introduction

Water is scarce in South Africa. In 1997, there was just over 1,200 kl of freshwater for each of the 45 million residents, putting the country on the threshold of the international definition of 'water stress' (DWAF 1997: 14). South African water law developed inappropriately to the nation's water scarcity. Moreover, access to water rights has, until recently, been skewed to the detriment of the majority of the population. The onset of democracy in 1994 led to the National Water Act of 1998 that addressed equitable access to, and government control over, water resources. Change will not come overnight, however, and the new water law and policy envisage a period of transition to full implementation of the Act.

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6.2 South African Water Law (1652–1910)

In 1652, the Dutch East India Trading Company established a settlement at the Cape of Good Hope to supply ships sailing from Europe to the East Indies, thus beginning the European colonization of South Africa. Dutch settlers introduced Roman–Dutch law, but not particularly regarding water law. Early on, the settlers applied the water law of Holland, where the sovereign was the *dominus fluminis*, or the 'owner of the river' (Milton 1995: 2). Water use was regulated by an administrative system whereby water rights were allocated by the authorities (Milton 1995; Thompson 2006). The rights could be withdrawn at any time (Hall 1974). Rights to use water were not based on ownership of riparian land (Milton 1995; Thompson 2006) and water use licences were allocated to owners of non-riparian land (De Wet 1959: 31)

In 1806, the British took possession of the Cape. They preserved the existing legal system (Gibson 1977), although gradually English law made its influence felt, especially through the English and Scottish lawyers on the Supreme Court established in 1828. Over time the system of water law came to be 'an unlikely amalgam of Roman law and American common law' (Milton 1995: 1).

The English influence did not affect water law immediately, as evidenced by the decision of *De Wet v Cloete* (1830), which still recognized the state as *dominus fluminis*. In *Retief v Louw* (1856), the Court ignored the *dominus fluminis* principle and approached the law of flowing waters as '*res nova*' (Milton 1995: 3). The Supreme Court held that, for perennial streams running over several adjoining land parcels, landowners 'have each a common right in the use of water which use, at every stage of its exercise by any one of the proprietors, is limited by a consideration of the rights of other proprietors' in essence, applying Anglo-American riparian rights (Milton 1995: 4).

Thereafter came a period of some confusion between the *dominus fluminis* principle and the new direction of *Retief*, resolved in *Hough v van der Merwe* (1874). Chief Justice De Villiers assumed that there was a legally significant distinction between public and private streams, but did not decide whether the watercourse under scrutiny was public or private, 'or whether the owner of land through which a private stream runs is entitled to the use of all the water flowing on to his land'. The Court also distinguished between ordinary and extraordinary use of water in a public stream. Ordinary use is what 'is required for the support of animal life and, in the case of riparian proprietors, for domestic purposes'. Extraordinary use is what 'is required for any other purpose'. An extraordinary use by an upstream owner could not interfere with a downstream owner's ordinary use. The owner of a land by or through which a public stream flows is entitled to divert a portion of the water for irrigation (an extraordinary purpose) provided that he does not thereby deprive a lower owner of water for their ordinary use, that he uses 'no more than a just and reasonable proportion of the water consistently with similar rights of irrigation in the lower proprietors', and that all excess water not used for irrigation returns to the public stream.

Milton (1995) suggests that the principles stated were almost certainly derived from American sources. De Wet (1959: 33) described these developments as follows:

> The old Supreme Court … handed [the state's] rights [in public rivers] over to the owners of riparian land as their private property.… No one who was not the owner of riparian land had any claim to the water in a public river. The very expression 'public river' had become a misnomer.

The principles set out in *Hough v van der Merwe* were refined by Chief Justice de Villiers in *Van Heerden v Wiese* (1880), in which the Court held that public streams consisted of perennial rivers and streams capable of common use by riparian owners. Other watercourses were private. The rights of riparian owners to water in public steams were limited by the 'natural rights of the public' and by the common rights of other riparian proprietors. On a private stream, the public had no rights and the lower proprietors could claim no right other than that established by long usage. A person had the right to deal as he chose with water rising on his own land, so long as it was not the source of a public stream. Courts in other South African jurisdictions followed this decision so that 'by the end of the nineteenth century the doctrine of riparian rights had become firmly established throughout South Africa' (De Wet 1959: 33). De Wet commented that 'this position could not be tolerated … where water is one of the scarcest … of our natural resources … [T]he principles of Roman Law [are] eminently better suited to South African conditions than … riparian rights'.

The legislatures did not see the problem, or, if they did, vested rights prevented any change. Thus the *Volksraad* of the South African Republic explicitly recognized the exclusive rights of riparian owners to the use of water flowing in public rivers (Law 11 of 1894). Expert recommendations on water law reform had little effect, although Water Courts were established by Cape Act 40 of 1899. These Courts would decide disputes relating to water rights and apportion water among riparians (De Wet 1959). Legislation codified, rather than reformed, the common law. The Cape, in consolidating its law in Act 32 of 1906, included intermittent streams within the ambit of public streams (Hall 1974: 6). The Transvaal followed the Cape lead, but provided for more central control by an Irrigation Department (Hall 1974).

6.3 Union Legislation

The Union of South Africa was created in 1910. Its Parliament enacted the Irrigation and Conservation of Waters Act 8 1912 to promote irrigation and to allow riparian owners to use water from public streams in order to do so (Thompson 2006). This Act, 'little more than a consolidating measure' (De Wet 1959: 34), constituted a compromise between the water imperatives of the different provinces (Thompson 2006; Hall 1974). The Act recognized riparian rights as dominant, although it authorized grants to non-riparian owners to use water not utilized by riparian owners (Nunes 1975; De Wet 1979). Special legislation addressed water requirements for non-riparian land (Thompson 2006). Other legislation circumvented water court orders that prevented authorities from carrying out water projects (Thompson 2006). About 40 such Acts were passed, and many remained in force until repealed by the National Water Act of 1998.

6.4 The Water Act 54 of 1956

The Water Act 54 replaced the Irrigation Act in 1956. The development of mining and secondary industries made it necessary to move away from riparian rights, which worked well as long as water was used for irrigation, to the old principle of State control of the use and disposal of public water (Scholtens 1956: 124). De Wet described the Act as a 'half-hearted attempt to restore to the community the rights lost by a process of judicial legislation, and the doctrine of "riparian rights" is by no means dead' (De Wet 1959: 35). The Act was enacted during the early apartheid era and its entrenchment of partial riparian rights led to inequality in access affecting the black population (Keightley 1995).

6.4.1 Public and Private Water

The Water Act had a complex conceptual approach to water pollution, regulating the matter differently depending on the type of water use, but its emphasis was on supply management (Glazewski 2000). The Water Act defined private water as all water that rises or falls naturally on any land or naturally drains or is led onto one or more pieces of land, but is not capable of common use for irrigation purposes (§1). The owner of the land on which private water was found had the exclusive use of the water (§5(1)), but pollution was prohibited (§23). The sale or disposal of private water was prohibited, except under authority of a permit from the Minister of Water Affairs (§5(2)).

The Act defined 'public water' as any water flowing or found in or derived from the bed of a public stream, whether visible or not (§1). A 'public stream' was defined (in essence) as a natural stream of water that flows in a known and defined channel, even if dry during part of the year, if the water is capable of common use for irrigation on two or more pieces of riparian land (§1). The right to use public water was divided into three categories: agricultural, urban, and industrial (§1). The right to use in respect of the first two categories rested in the riparian owner. Such owner had a share of the normal flow of the water in the public stream, as fixed by the water court (§§9(10), 52). A riparian owner was authorized to use all the surplus water—water in a public stream that is not normal flow (§1)—for beneficial agricultural or urban purposes and need not abate such use in favour of other riparian owners (§10(1)). Certain persons who were not riparian owners were authorized to use public water for certain limited purposes (§7). Use of public water for industrial purposes was subject to the permission of a water court or the Minister (§11(1)), but a person (including an industry) supplied with water by a local authority or body with the right to supply/control water was not required to have official permission. A person could use public water for defined purposes only to the extent that the use was beneficial (§10(1)). Wasteful use was prohibited (§§9(1)(a), 170). There was no fee for using water extracted directly from a public or private water source.

Ground water could be either public or private water if it fitted within the relevant definition, in which case the Water Act governed it. Ground water could also be 'subterranean water' if found in a subterranean government water control area and hence under state control, or it could be that it was neither public, nor private water, nor under state control (Lyster & Lazarus 1995), in which case it was subject to common-law principles.

6.4.2 State Control

The state had the power, in certain circumstances, to restrict riparian owners' rights, although less than in other countries with similarly scarce water resources. The Water Act provided for the declaration of a number of types of control areas, where the control of water use was deemed by the Minister to be desirable in the 'public interest' or 'national interest'. These included subterranean government control areas (§28), government water control areas (§59), irrigation districts (§§71, 73), government drainage control areas (§59(5)), catchment control areas (§59(2)), dam basin control areas (§59(4)(a)), and water sport control areas.

6.5 The Need for a New Water Law with the End of Apartheid

In 1994, South Africa adopted an interim Constitution and held its first elections based on universal franchise. This resulted in a government headed by the African National Congress, whose agenda included redressing the impacts of apartheid on water law.

6.5.1 The Constitutional Dimension

The Constitution of the Republic of South Africa of 1996 includes both an environmental right and a right to water. Section 24 provides that 'Everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.' Section 27 provides as follows '(1) Everyone has the right to have access to (a) …, (b) sufficient food and water; …(2) The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of each of these rights.'

The water legislation in South Africa must be considered in light of these two fundamental rights and other relevant rights, including rights to equality, dignity, life, property, and administrative justice. The Constitution also determines the legislative and administrative competence in the water field. Certain matters are of concurrent national and provincial legislative competence, whilst others are of exclusive provincial competence. Both the national Parliament and provincial legislatures may legislate on the environment. Water, however, is of exclusive national legislative competence, reflecting the national importance of water in a water-scarce country. The Department of Water Affairs and Forestry and its regional departments control water.

6.5.2 The Background to the National Water Act of 1998

The new government undertook an extensive review of water law on issues of equity. The 1956 Water Act was based on riparian rights, which privileged white farmers and excluded the majority of South Africans from access to water (WLRP 1996). Although the 1956 Act was seen by some as a reversion towards the state as *dominus fluminis* and away from riparian rights because it provided for increasing government control over water, the recognition of riparian rights in practice was still prominent and government powers were not widely used. The government initiated a consultative process for developing principles and objectives for a new water law which resulted in the *White Paper on a National Water Policy for South Africa* (DWAF 1997; WLRP 1996). The White Paper found that in 1997 12–14 million South Africans (out of a total population of about 40 million) were without access to safe water and over 20 million were without adequate sanitation. Most were black, mainly living in peri-urban and rural areas. Women and children, who fetched water, were particularly vulnerable to diseases resulting from inadequate sanitation and lack of clean water.

At the heart of the government's water law proposal was its development vision—the Reconstruction and Development Programme, which aimed at physical and infrastructural development, but also at improving quality of human life as a precondition for growth. The Programme focused on meeting basic needs, developing human resources, building the economy, and democratizing the state. These principles were reflected in the Growth, Employment and Redistribution Strategy, which emphasized land reform, agricultural development, and the provision of infrastructure, notably for water.

Another consideration influencing water policy was administrative efficiency, given administrative, resource, and capacity constraints. In introducing radical new policy initiatives, the White Paper recognized the need to take into account an estimated 40,000 permits, allocations, or scheduling provisions under the existing Water Act, 800 water court orders covering water use on 30,000 properties, and five million boreholes (DWAF 1997). Hence, the Department decided on a set of water principles. First, the government must be the custodian of national water resources

in order to manage effectively a critical strategic resource. Second, there must be equitable access to water by all. Third, the hydrological cycle is a single system and the water needs of the environment are crucial for the healthy operation of that cycle. Fourth, the international dimensions of South Africa's water resources and the rights of neighbouring countries are recognized.

6.6 The National Water Act 36 of 1998

The new National Water Act aims to ensure that the nation's water resources are protected, used, developed, conserved, managed, and controlled to meet basic needs of present and future generations, promote equitable access to water; redress racial and gender discrimination, promote efficient, sustainable, and beneficial use of water in the public interest, facilitate social and economic development, provide for growing demand for water, protect ecosystems and biological diversity, reduce and prevent the pollution and degradation of water resources; meet international obligations, promote dam safety, and manage floods and droughts (§2). The Minister of Water Affairs and Forestry, acting on behalf of the national government as public trustee of the nation's waters, is responsible for ensuring the equitable allocation of water and its beneficial use in the public interest and for promoting environmental values, including sustainability (§3).

The Act contains several innovations while recognizing existing rights until complete implementation of the new law becomes possible. The country is divided into various water management areas, managed by catchment management agencies (ch. 7; see map) in accordance with the national water resource strategy, which sets out the objectives, plans, guidelines, procedures, and institutional arrangements for the protection, use, development, conservation, management and control of water resources within the policy framework (§6). The Act is comprehensive, addressing the establishment of water management areas, the requirements of the Reserve, establishment of water demand management principles, and the setting of water quality objectives. Individual catchment management strategies can be adopted by the relevant catchment management agencies (§8) and may be more detailed than, though consistent with, national standards (§9(b)).

The Act's water planning regime includes a water resources classification system, involving determination of the class of the water resource and resource quality objectives (§13). Central to this determination is the 'Reserve' defined (§1) as:

'the quantity and quality of water required—

(a) to satisfy basic human needs by securing a basic water supply, as prescribed under the Water Services Act for people who are now or who will, in the reasonably near future, be—

  (i) relying upon;
  (ii) taking water from; or
  (iii) being supplied from, the relevant water resource; and

(b) to protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resource'.

The Reserve applies to a relevant 'water resource', including watercourses, surface waters, estuaries, or aquifers. The *White Paper* envisaged that basic needs would have priority over ecological needs, but the definition in the Act does not do so (Glazewski 2000). The Reserve must be determined as to quantity and quality for individual water sources (§16). This entails highly technical administrative decisions in a time-consuming process. Decisions on water use are to be determined with reference to the Reserve, which is a priority use. The full quantity of water in a particular water source may be required for the Reserve in some instances. Pending final determination of the Reserve, the Act provides for a preliminary determination as the necessary prerequisite for the authorization of water use (§17).

Section 21 defines 'water use' as including not only 'use' (abstracting water), but also abuse (waste or effluent disposal). The Act provides that water use is subject to licensing except in three situations (§22). First, where water use is permissible under Schedule 1 as likely to have insignificant impacts on water resources—water for reasonable domestic use, watering of animals (excluding feedlots), recreational purposes, and the discharge of water or waste into a canal, the sea, or a conduit controlled by another person authorized to undertake the purification, treatment, or disposal of waste or water containing waste, with the approval of that person. Second, if a water use is a continuation of an existing lawful use occurring within 2 years immediately preceding the enactment of the Act (§23), a user can continue the use until a licence is required in terms of the Act, if at all (§34). As a result of this exemption, many users (particularly riparian users) who had rights to water before 1998 continue to do so without change. Third, a water use may be authorized through a general authorization (§39) regarding a specific water resource or for a specific geographical area—taking or storing water from a water source, irrigation with waste water from an industrial activity or a waterwork, discharge of waste into a water source, and waste disposal that may detrimentally impact on a water resource (DWAF 1999). General authorizations obviate the need for individual licences, thereby freeing up administrative resources to address other matters and eliminating cost, delay, and other burdens.

Two of the activities defined as water use by §21 are stream flow reduction activities and controlled activities. Such activities require a licence except for the exceptions. Stream flow reduction activities include commercial afforestation of land and any other activity designated by the Minister (§36). This provision has not been well received by the commercial forestry sector because it raises the possibility of needing an authorization and possibly of having to pay for the benefit of rain falling on plantations, hitherto a free resource. The government is considering declaring that sugarcane farming, a significant monoculture, is a stream flow reduction activity. Controlled activities, such as irrigation of land with wastewater generated through any industrial activity or by a waterwork, and an activity aimed at the modification of atmospheric precipitation, amongst others, including all activities indicated for control by the Minister, also require licensing (§37). The use of water resources

under stress also requires compulsory licensing (§43). The responsible authority is required to draw up an allocation schedule in response to applications for licences, which must take into account several specified factors, including the requirements of the Reserve and existing licensed users.

Water management under the Act is complex, involving substantial administration. The legislature relieved the taxpayer's burden by providing for water use charges, when considered appropriate, and empowering the Minister to provide for financial assistance to deserving recipients (ch. 5). The Act provides for catchment management agencies to decentralize management, and water user associations, which operate at a localized level and are cooperative associations of water users to undertake water-related activities for their mutual benefit (chs. 7, 8). Water bodies under the 1956 Act (e.g., irrigation boards and others) continue until replaced by water user associations (§98). Chapter 9 empowers the Minister to establish advisory committees. A Water Tribunal handles dispute resolution, especially appeals against various decisions made under the Act. Appeals from the Water Tribunal go to the High Court (§149).

Enforcement is a crucial component. The National Water Act criminalizes several activities, including failure to comply with conditions attached to water use and water pollution (§151). The maximum penalty for a first pollution offence is a fine or 5 years imprisonment. A convicting court is empowered to order compensation for loss suffered by any person as a result of non-compliance with the Act, obviating the need for separate civil proceedings.

The Act also covers the international dimension of South African waters, authorizing the establishment of bodies to implement international water agreements (ch. 10). Because South Africa shares various watercourses with other countries, either as borders or because rivers flow through South Africa to other countries, the Department must consider international rights and obligations in the National Water Resources Strategy (§6(1)). South Africa is a party to several bilateral or multilateral committees and commissions relating to water, and is also a member of the Southern African Development Community Protocol on Shared Watercourses of 2000 (Ramoeli 2002; see Chapter 15, Van der Zaag, this book). The Act also addresses government waterworks (ch. 11), dam safety (ch. 12), and national monitoring and information systems (ch. 14).

6.7 The Water Services Act 108 of 1997

The National Water Act operates in tandem with the Water Services Act. The Water Services Act provides for the establishment and the powers and responsibilities of water services institutions—water services authorities, water services providers, water services intermediaries, water boards, and water services committees. It's objects include: (a) the right of access to basic water supply and basic sanitation; (b) the setting of national standards for water services and tariffs; (c) the preparation and adoption of water services development plans by water services authorities;

(d) a regulatory framework for water services institutions; (e) establishment, disestablishment, and powers and duties of water boards and water services committees; (f) monitoring of water services; (g) financial assistance to water services institutions; (h) a national information system; (i) accountability of water services providers; and (j) promotion of effective water resource management and conservation (§2).

Everyone has the right of access to basic water supply and basic sanitation (§3), thereby implementing the Constitutional right (Constitution 1996: §27). Water services institutions must take reasonable measures to realize these rights. Section 4 requires water services providers to provide such services under conditions set by the provider. Section 9 authorizes compulsory national standards for water services that the Minister has prescribed (DWAF 2001). Regulation 3 requires the provision of a minimum of 25 *l* of potable water per person per day or 6 kl per household per month, at a minimum flow rate of not less than 10 *l* per min within 200 m of a household and with no consumer going without a supply for more than 7 full days in any year.

6.8 The National Water Resources Strategy

The National Water Resources Strategy was released in 2004 under §5 of the Act. Under §7, the Minister, the Director-General, organs of state, and water management institutions must give effect to the national water resource strategy when exercising any power or performing any duty under the Act. The Strategy aims to achieve: equity in access to water services, the use of water resources, and the benefits from the use of water resources; sustainability by progressively striking a balance between water availability and legitimate water requirements, and by implementing measures to protect water resources; and efficient and effective water use for optimum social and economic benefit (DWAF 2004a). The Strategy 'must provide information about the ways in which water resources will be managed and the institutions to be established. It must also provide quantitative information about the present and future availability of and requirements for water in water management areas, and propose interventions by which these may be reconciled. [It] must also quantify the proportion of available water in each water management area that falls under the direct control of the Minister …' (DWAF 2004a: 8). The Strategy is based on the concept of integrated water resources management, 'a process which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems' (DWAF 2004a: 10).

Chapter 2 deals with the water situation, strategies to balance supply and demand, data on yield and use of water nationally and for individual water management areas, and how the balance between supply and demand will be achieved in likely future scenarios, taking into account factors such as climate change. While overall supply exceeds demand, deficits exist in more than half the water management areas.

Shortages are more serious than appears because current figures do not consider the requirements of the Reserve to be phased in. Chapter 3 deals with strategies for water resources management, combining resource-directed measures (focusing on water quality) and source-directed controls (defining limits and constraints on water use). The Act envisages classifying national water resources according to their degree of degradation tied closely with the determination of the Reserve and resource quality objectives. The chapter also considers: groundwater resources and wetlands; authorization (licensing) of water use; water quality; and the procedural and other requirements necessary for the proper functioning of the system.

Three principles are identified for water conservation and water demand management: (a) water institutions are to supply water efficiently and effectively, minimizing water losses and promoting conservation among consumers; (b) water should be used efficiently and without waste; and (c) conservation and demand management should be integral to the planning processes for water resources, water supply, and water services. The Strategy considers the application of these principles in different sectors (such as industry and agriculture) and the important threat to water posed by alien vegetation. Pricing strategies are developed for various types of water use; charges are to be specific to four end-user sectors: municipal (water services authorities); industry, mining and energy; agriculture; and stream flow reduction activities. The Strategy also considers financial assistance through subsidies. Indicated timeframes are supposed to be 'indicative' rather than rigid for, *inter alia*, compulsory licensing, the establishment of catchment management agencies and international water-sharing arrangements, and the development of infrastructure. The Strategy anticipates that compulsory licensing will commence in some water management areas from 2004 and in others after 2009, with the entire process spread over about 21 years. High-priority licensing matters will be completed by 2019. It is estimated that some catchment management agencies will be established by 2006, others will be in place by 2010, and all will probably be fully functional by 2016.

Chapter 4 looks at 'complimentary strategies', focusing on: building capacity and expertise among practitioners in the water sector; educating and creating awareness among stakeholders; and water research. Chapter 5 deals with national planning and coordination and international cooperation in water management, recognizes that the Act has important inter-relationships with other legislation (such as the Water Services Act) and that cooperative relationships with other institutions, local and international, are required for effective implementation of the strategy. Key appendices contain the fundamental principles and objectives for South African water law (App. A) and contains substantial information about water management areas and their relation to strategic perspectives (App. D).

The Strategy comprehensively coves all issues for effective management of national water resources. Full implementation of the National Water Act cannot be expected for several years. The Strategy appeared only in 2004, 6 years after promulgation of the Act, because huge amounts of data, relating especially to current water quality, quantity, demand, and current usage, had to be gathered, collated, analyzed, and considered in the context of projected future demand.

Some determinations (such as those relating to the Reserve) are preliminary determinations, which may be changed in the future. The Strategy is a dynamic document that can be changed depending on changes in circumstances and is statutorily required to be reviewed every 5 years (§5(4)(b)).

6.9 Key Implementation Challenges

The National Water Strategy reveals many issues that require attention before the National Water Act can be fully implemented. Some concerns, not all of which are necessarily recognized or discussed in the Strategy, are considered here.

6.9.1 Over-Bureaucratization of the National Water Act

The National Water Act envisages a licensing system for allocations of water use, which will increase the administrative burden on the Department of Water Affairs and Forestry. Bronstein has described this as 'unnecessarily interventionist legislation' because she believes that such allocation should be left to the market (Bronstein 2002: 469). Inadequate capacity to carry out the licensing system may be conducive to corruption and maladministration. The guidelines for licensing provide 'no real guidance' and 'ensures that administrators making licensing decisions will operate squarely in the realm of politics' (Bronstein 2002: 476). Bronstein argues that discretionary licensing can be acceptable only if it is 'offset by clearly defined benefits', such as in 'catchments that experience water stress. In targeted contexts such as these, licensing is much easier to justify. Targeted schemes cost less than untargeted schemes and their benefits can be considerable' (Bronstein 2002: 481).

There *is* a problem with overambitious legislation in the presence of administrative incapacity, yet the Act's recognition of existing lawful use and general authorizations likely will be utilized in a way that requires little administrative intervention and licensing will *only* be utilized in areas identified as experiencing water stress or where other compelling features require administrative intervention (*see* §43). This would accord with Bronstein's conception of targeted interventions where the cost of the licensing process would be outweighed by the benefits. The temptation to use the powers in the Act where they are not necessary should be resisted for the reasons she raises.

6.9.2 Water Rights, the Constitutional Property Clause and Compensation for Expropriation

Existing water-rights holders may be impacted by the National Water Act if they are deprived of their rights. Is such deprivation lawful? If so, will those deprived be entitled to compensation?

The Constitution, §25 states:

(1) No one may be deprived of property except in terms of law of general application, and no law may permit arbitrary deprivation of property.
(2) Property may be expropriated only in terms of law of general application—

(a) For a public purpose or in the public interest; and
(b) Subject to compensation, the amount of which and the time and manner of payment of which have either been agreed to by those affected or decided or approved by a court.

The National Water Act recognizes the continuation of existing lawful water uses, but provides that persons continuing such water uses may be required to obtain a license under the Act in the future (§43). Does compulsory licensing deprive a water user of property and does this have to be compensated? A water right in South African common law amounts to 'a right to use water with a guarantee of priority (in amount, quality, and time) but bounded by the concept of beneficial use and subject to regulation by the State in the public interest' (Klug 1997: 6). The core of this right is the right of access to water. The requirement of compulsory licensing, which is contemplated primarily in areas suffering from water stress and not across the board, could lead to water users' current allocations (which arose under common law and not subject to an administrative allocation) being reduced or perhaps removed altogether. Is such reduction or removal of an existing allocation an expropriation of water rights (in which case it would attract compensation)? If not, what are the consequences of such a deprivation?

The Constitutional Court held in *Harksen v Lane NO* (¶¶29–39) that expropriation consists of a transfer of property to the State. The Act does not transfer water rights to the State and thus is not an expropriation. Even if this definition were widened, there are compelling reasons to regard such measures as not an expropriation, but rather as a regulation of property (Soltau 1999: 246). In reducing existing water allocations, a determination that a water-rights holder is making beneficial use only of a certain quantity of water, at a certain time and in a particular place, means than any additional water is merely disassociated from the pre-existing right (Klug 1997: 7). In these cases, at least, the person is not deprived of property and there is no Constitutional requirement to pay compensation.

In other cases, however, the amount by which a particular user's allocation could be reduced would amount to a deprivation of a right. A deprivation must be in a law of general application and must not be arbitrary. The Constitutional Court has recently set down a test for arbitrariness in *First National Bank of SA Ltd v Commissioner, South African Revenue Service* (¶100). The deprivation of water rights in terms of the Act is unlikely to be found arbitrary under this approach. The Act, however, provides for compensation to be paid to persons deprived of water rights in certain circumstances. Section 22(6) provides that any person who has applied for a licence in terms of §43 in respect of an existing lawful water use, and whose application has been refused or who has been granted a licence for a lesser use than the existing lawful water use, resulting in severe prejudice to the economic

viability of an undertaking in respect of which the water was beneficially used, may claim compensation for any financial loss suffered in consequence. This issue will be decided by the Water Tribunal (§22(8)), which will determine the amount payable:

(a) In accordance with §25(3) of the Constitution and
(b) By disregarding any reduction in the existing lawful water use made in order to—

(i) Provide for the Reserve
(ii) Rectify an over-allocation of water use from the resource in question or
(iii) Rectify an unfair or disproportionate water use (§22(7))

Regulation of water use by means provided in the National Water Act thus is unlikely to infringe the Constitutional right to property. In many cases where existing water allocations are reduced, users will not suffer 'severe prejudice to the economic viability of [their] undertaking' and payment of compensation will not be necessary. Fairness and equity require that those who suffer disproportionately as a result of the implementation of new water policy not bear the cost of doing so, and they are entitled to compensation under the Act.

6.9.3 The Right of Access to Water and a Basic Water Supply

The right of access to water by all South Africans is now entrenched in legislation. The backlog of people without access is being addressed by direct provision of water to houses or providing access to water within a reasonable distance of people's dwellings. The major policy initiative is the Free Basic Water Programme of 2001. The Department recently provided water to 36.5 million people out of 48.5 million (DWAF 2006). Although the shortfall appears to be about the same as it was in 1997 (DWAF 1997), the population has grown and the Department has provided access to water to more than ten million people. Regulation 3 of the June 2001 regulations under the Water Services Act was summarized above (DWAF 2001), and this is the amount upon which the government's Free Basic Water policy is based.

In *Mazibuko v City of Johannesburg*, the Court held that the City's decision to limit free basic water to 25 l per person per day (6 kl per household per month) was unlawful and must be set aside because this amount was 'woefully insufficient' and the City had the capacity to increase this amount to 50 *l* per day. This corresponds to several international recommendations for basic water requirements (Kidd 2004). This decision will have financial consequences for water services providers, particularly because the Court held that it was unlawful for a supplier to disconnect the water supply of an indigent water user. In certain areas, municipalities have dealt with shortfalls because of consumers who historically used considerably more than the free basic water allocation levels by imposing a premium tariff on the 'excess' usage. In other areas, municipalities face difficulties in finding enough water to meet their responsibilities. Moreover, some water services

institutions have been privatized and this raises some concerns about addressing human rights considerations (Chirwa 2004). *Mazibuko* will probably not be the last word on the matter.

6.9.4 Water Quality Concerns

The Act's commitment to the ecological Reserve is welcome, but there must not only be a sufficient *quantity* of water to meet ecological needs, but also the *quality* of water must not compromise the health of aquatic ecosystems. The sources of pollution of surface waters are agricultural drainage and wash-off (irrigation returns, fertilizers, pesticides, and runoff from feedlots), urban wash-off and effluent flows (bacteria, salts, and nutrients), industries (chemicals), mining (acids and salts) and areas with insufficient sanitation services (microbes); sources of pollution of groundwater are from mining activities, leachate from landfills and human settlement, and intrusion of seawater (DWAF 2004a: 24). The main problems are sedimentation, threat to biota, water quality, and reduced water flow. High levels of sedimentation are due in part to poor land management, including the removal of vegetation in catchment areas. Natural biotas in freshwater systems have been affected by several factors: impoundments (dams) and inter-basin transfers, the introduction of alien species, poor water quality, and reduction or cessation of river flows.

The main quality issues are salination, eutrophication, and pollution (DWAF 2004a). Salination, naturally high in many rivers is increased by human activities, and results in water becoming unfit for irrigation. Treatment is very expensive. Eutrophication leads to growth of water plants and algae, which affects other aquatic life. Contributing factors are animal and human waste, fertilizers, and storm water run-off, which in many cases enter water systems from non-point sources, making the problem difficult to control. Pollution in general is problematic (Fuggle & Rabie 1994). Also troubling is the proliferation of alien biota, both plant (many of which benefit from eutrophic conditions and often require more water than the indigenous vegetation) and animal, including a number of fish species that compete with indigenous species (Fuggle & Rabie 1994). The Department of Water Affairs and Forestry's Working for Water programme aims to clear catchments of alien plants. Water abstraction and impoundments also profoundly affect the flow of many rivers, converting perennial rivers to seasonal ones to the detriment of both the environment and society (Fuggle & Rabie 1994).

In 1994, the Department initiated the River Health Programme, which aims to: measure and assess the ecological state of aquatic ecosystems; detect and report spatial and temporal trends in the state of aquatic ecosystems; identify and report emerging problems regarding aquatic ecosystems; and ensure that all reports provide scientifically and managerially relevant information for national aquatic ecosystem management (RHP 2006). A preliminary analysis of the data collected in the Programme indicates that 6% of rivers studied are overall in a natural condition, 22% are good, 44% are fair, and 28% are in a poor condition. Almost all of the rivers surveyed

have some parts that are overall in a poor condition, predominantly those situated in, or downstream of, urban and industrial areas (DWAF 2004b). The National Water Resources Strategy addresses water quality concerns by: formulating objectives for managing sources of pollution and single source interventions; benchmarking water resource quality; identifying emerging threats to the waters; and establishing priorities in relation to remediation of water resources and degraded land as a focus for source-directed controls (DWAF 2004a).

The challenges are large. Many of the problems facing South Africa's watercourses will require more than resource directed measures. Water quality issues often result from land use and socio-development issues that are beyond the mandate of the Department. For example, rivers that run through communal areas where people have no sanitation invariably are polluted. This can only be addressed by socio-economic development and the provision of sanitation.

6.10 Conclusion

After decades of inequitable access to water resources by the majority of the country, and inappropriate legal approaches to managing such resources, the arrival of democracy in 1994 heralded a new era. The National Water Act is ambitious, aiming at achieving effective, sustainable management of South Africa's water resources in order to ensure not only that all people have access to a scarce resource but also that there is enough water available to meet environmental needs. The Act relies on a considerable administrative undertaking that cannot be implemented immediately. The most prominent challenges to implementation have been discussed, but mechanisms and continuing policy and strategic development are in place to allow for achievement of the Act's objectives. We will be able to appreciate the full benefits of the new legislation only some years into the future.

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Chapter 7
East African Water Regimes: The Case of Kenya

David Nilsson and Ezekiel Nyangeri Nyanchaga

Abstract This chapter outlines the evolution of water regimes in East Africa since pre-colonial times with a special focus on Kenya. It discusses how institutions and organizations for managing water resources and domestic water supply have been successively developed and fused with previous regimes. Institutions introduced as part of the colonization process in the early 1900s have partly–but not completely–replaced customary water regimes. After independence, new public objectives and evolving social structures prompted changes in the water regime, but institutions and organizations established under colonial rule were largely kept intact. The provision of services has not expanded as planned and many people still lack reasonable access to water and sanitation services. Currently, reforms are carried out to improve performance of the sector. Although the emerging water regime may lead to an increased cost recovery, it provides no guarantee for improved and sustainable service for the poor.

Keywords East Africa • history • water institutions • water policy • water resources

7.1 Introduction: Is There an East African Water Regime?

East Africa offers an abundance of different climate zones and biotopes, from humid tropical rainforests to arid plains, from coastal zones to the snow-clad peaks in the mountain ranges. Similarly, there has always been great cultural diversity in

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the region, which is reflected in a profusion of languages. In Kenya alone, there are more than thirty different indigenous languages spoken in addition to Asiatic languages and English (Laitin & Eastman 1989: 52). Historically, managing water resources has been important for East African societies. Traditional East African societies created institutions that provide the social rules for water management, as well as organization to control, develop, and maintain resources. They have established a 'water regime', used here to include the rules of social interaction regarding water and a social organization to carry out collective action under the institutional framework. In this context, the water regime concept is also associated with a normative and prescriptive power structure and a chain of command. Because of the cultural diversity in East Africa, there never existed a uniform water regime. Nevertheless, there is much similarity through the region owing to the colonial period. The advent of colonialism in the late nineteenth century brought new culture and a new social order. The colonial administration imposed new institutions and a new organization for controlling and managing resources including water. These institutions still influence water regimes in East Africa and the performance of the national water sectors. Although the water and sanitation sectors in East Africa perform better than some other African countries, there are still millions of poor people without adequate water and sanitation. In 2004, the percentage of the population with access to a safe water supply was estimated at 62% in Tanzania, 61% in Kenya and 60% in Uganda, while coverage of sanitation services were even lower (United Nations Development Programme 2006: 307–08). To improve services, sector reforms are ongoing in all three countries.

This chapter investigates the history of water regimes in East Africa, focusing on water institutions and the role of the state. It analyzes the trajectory of the institutional framework in relation to customary law and to current sector reforms covering the twentieth century and up until today. Special attention is given to domestic water supply, and the history of Kenya.

7.2 Early Water Regimes

This section surveys the water regimes from the pre-colonial period and provides a broad overview of how the establishment of a colonial system in East Africa altered the water regimes in the region.

7.2.1 Traditional Water Regimes in East Africa

Indigenous cultures erected infrastructure as well as institutions to control and manage water long before the colonialists. It is sufficient to point to the fairly advanced irrigation systems that were in use in the Rift Valley at Engaruka in Tanzania, around

1400–1700 CE (Sutton 2004). Studying the history of traditional water institutions in East Africa is, however, not straightforward as these institutions have generally not been codified or written down. Instead, they are embedded in traditional culture. It could be tempting to classify water regimes as either pre-colonial, colonial or post-colonial. However, it would be misleading because it could imply a linear evolution from one regime to the other. Moreover, there are no clear-cut boundaries between these regimes. Colonial institutions for water were preserved long after independence and old water management practices and institutions that existed before colonization have coexisted all along. We therefore prefer to label water institutions with a long indigenous history as traditional, or customary, institutions.

Meinzen-Dick and Nkonya (2005: 8–4) have identified some general features in much of African customary water law. First, water is a resource commonly held by the community and no person can be denied water for 'primary uses' such as domestic water supply. Despite this universal right for domestic water, certain water rights can be allocated to groups or individuals for specific uses. Water is treated as a common good, but certain water rights can be acquired. Although water is a common good, this should not be confused with an open-access system (Carlsson 2003). Institutions are put in place to exert control over the resource. The control and rights to water exercised by an individual or a group increase with the group's input of labour or capital into the development of the resource (Huggins 2000). Often these water rights are not fixed, but negotiable, in order to adapt to changing circumstances. In times of water scarcity, tougher restrictions may be imposed on water uses and earlier rights revoked. Such renegotiation of claims and rights under external pressure has been recorded in traditional communities in both Kenya and Tanzania (Drangert 1993; Orindi & Huggins 2005).

What sometimes could be perceived as an insecurity of tenure in the customary water regime could instead be seen as a rational response to manage uncertainty in the physical environment (Ostrom 1990). This is illustrated by the Meru people of Tanzania, where water rights were traditionally allocated through the governance systems of chiefdoms. An individual could be given permission to invest in and develop a new water source, and acquire the rights to use that water. Although the well owner could not deny others the use of the water, according to custom, he could expect a gift as payment in return. Furthermore, although the water was a common property, all produce resulting from the use of the water was the property of the individual (Carlsson 2003). Productive uses of the water were accompanied with secure property rights to the products, which correspond to the *usufruct* principle of Roman law.

Despite colonization and more recent sector reforms, customary water institutions have partly persisted, and are still important in some rural communities (Carlsson 2003; Drangert 1993; Orindi & Huggins 2005). This has created a situation where several water regimes coexist and overlap. In East Africa, customary institutions still form an integrated part of governance systems at village or clan level (Huggins 2000). Today these customary institutions are sometimes labelled as 'informal' because they are contrasted to the statutory or 'formal' institutional framework. This does not imply that customary water institutions are redundant. In fact, there may still be an important role to play for these traditional regimes,

especially in community-based approaches for sustainable water management and poverty reduction (Drangert 1993; Orindi & Huggins 2005).

7.2.2 Enter the Colonial Water Regime

The colonization of East Africa took off in the late nineteenth century. Lacking large mineral resources to exploit, the colonies built their economies on agriculture. In Uganda, the market-based agriculture relied on production—mainly cotton—by the indigenous people (Engdahl 1999). Both Kenya and Tanzania, however, soon developed agricultural economies within the colonial system based on European settlement. The most attractive and productive areas in Kenya and Tanzania were secured for European settlements and cash crop production (Maxon 1992; van Zwanenberg & King 1975).

With colonization and the appropriation of land came also an institutional framework for property rights and governance. In East Africa, as in other parts of the British Empire, a dual legal regime was established from the early colonial period. Areas designated as 'crown lands' were governed by statutory law introduced by the colonial administration and 'native lands' (or 'reserves') were governed by customary law. This was the essence of British 'indirect rule'; some governance and judiciary matters were delegated to native authorities in their own areas of jurisdiction while the colonial governments were to deal with the crown lands. This dual legal system was important for the preservation of traditional water institutions in East African countries (Carlsson 2003).

In Kenya and Tanzania, where the colonizers had substantial economic interests in agricultural production, establishing secure tenure for land as well as water was important. Provisions were made in the early 1900s for granting water rights through land legislation. The settlers brought with them their own customary institutions, in the form of the English common law. These customary institutions provided a kind of *de facto* property rights system based on riparian rights all over the British empire, such as in Australia (Chapter 11, McKay & Marsden, this book), India (Chapter 10, Cullet & Gupta, this book) and South Africa (Chapter 6, Kidd, this book). In Kenya, English common law was practiced prior to the establishment of statutory water legislation. In Tanzania, English common law was also practiced in water disputes, in cases where the statutory legislation was ambiguous (Carlsson 2003). In Tanzania the first statutory water legislation was the Water Ordinance of 1923 (Drangert 1993). Kenya soon would follow with the Water Ordinance of 1929 (see below). Uganda enacted the Water Works Ordinance of 1928 but this only dealt with water supply in towns. This reflects some of the colonial interests at large in East Africa. Securing rights to water, for example, for agriculture was important for the settler economies in Kenya and Tanzania, while the colonial administration in Uganda focused more on providing the predominantly urban-based European and Asian immigrants with water and sanitation services (Nilsson 2006). Thus, the introduction of statutory water law and the assembling of water regimes based in the colonial state was a major shift from customary institutions.

7.3 The Evolution of Water Institutions in Kenya (1895–2008)

The remainder of this chapter focuses on the evolution of the statutory regime in Kenya. This section maps the trajectory of the formal water institutions in Kenya. The narrative is sequenced into four subsections, each representing a characteristic period. The section concludes by referring to similar developments in other parts of East Africa.

7.3.1 Early Colonial Water Policy (1895–1920)

With the Uganda railway, the importance of Mombasa as a colonial headquarters and as the gateway to the rest of East Africa increased. In 1895, Mombasa had 24,000 inhabitants, and meeting the growing demand for water from wells within towns was increasingly difficult (Willis 1995). The Protectorate government was compelled to act and a 'condensing plant' was brought from Britain in 1895 to supply the Europeans with clean water. The government in 1898–99 also attempted to license a private water provider to develop the water supply (British East Africa Protectorate 1898; Whitehouse 1951). However, outside Mombasa, the government would not assume responsibility initially. Water supply in the towns that sprung up along the railway, i.e., Nairobi, Nakuru, and Kisumu, was instead the responsibility of the Uganda Railways (Nilsson & Nyangeri 2008).

Gradually, the state took on an enlarged role relative to water in the first 2 decades of the 1900s. In Mombasa, the water shortage persisted and, with the strategic interests of the colony at stake, the colonial government stepped in to construct a new water supply between 1912 and 1917. This was the first major undertaking by the state for public water supply in Kenya (Willis 1995). Apart from Mombasa, the government still refrained from direct service provision. In Nakuru, the state through its Public Works Department developed a new water supply from the Mereroni River in 1913–1915, but the railway authorities were charged with the operations of the supply once it had been completed (Doria n.d.). The state also enrolled private organizations or individuals for public water supplies. In 1914, the Government contracted the Muthaiga Water Supply Company to supply water to the up-market areas of Nairobi that were not covered by the railway's network (Kenya 1913–1923).

The first legislation pertaining to water rights in Kenya was contained in the Crown Lands Ordinance of 1902 and the Water Rules of 1903. The legislation proved ineffective because it did not clearly define property rights and authority over water (Sikes 1926). Hence, the Crown Lands Ordinance of 1902 was repealed and re-enacted as the Crown Lands Ordinance of 1915. Already at this stage, the state tried to exert stricter control over the water resources through a system of water use permits, and backtracking on universal riparian rights (Crown Lands Water Permit Rules 1919).

The colonial government acknowledged the need for a comprehensive water legislation through which the state would establish sovereignty over all water resources. The first attempt to establish a water law was the solo effort by the then Director of Public Works Department, Sir McGregor Ross, in response to the request of the colonial government in 1916. He presented a document, which later came to be known as the Draft Water Ordinance of 1916. The Draft Ordinance sought to establish 'state ownership and control supreme, not only of all rivers and lakes but also of their beds and banks, and also of subterranean waters'. It furthermore sought to do away with problems stemming from the practice of English common law through 'as complete a removal as possible of water disputes from the Courts' (Ross 1916; Water Legislation Committee 1928). It would take another 35 years before Sir Ross' ambitions in the Draft Ordinance would be fulfilled.

In summary, for the first 25 years of colonial rule, the state kept a low profile for the management of water resources and water supply in Kenya. Awareness was, however, growing about the necessity of stronger public involvement for water resources management and urban water supply. The scene was set for the emergence of state responsibility for water.

7.3.2 The Emergence of State Control (1920–1945)

After the First World War, the process of introducing water legislation resumed. The Director of the Public Works Department, H.L. Sikes, was commissioned to investigate how the new water legislation should be crafted. Sikes analyzed and compared water laws from Canada, the United States, Australia, New Zealand, Southern Rhodesia, South Africa, and several European countries. His report (Sikes 1926) discussed water laws in Britain and maintained that the English common law was a major impediment for efficient use of water resources as 'Uncertainty of tenure militates against development' (Sikes 1926: 7). By this time, the ambiguity of the law and uncertainty regarding water rights had resulted in an increasing number of water disputes. It was seen as imperative for the state to assume supreme control and ownership of water resources. The draft water legislation, however, was again never enacted owing to the economic slump of 1922 that led to a trimming of the Public Works Department staff by 50%. It became obvious that the ordinance, if enacted, could not be administered with the reduced staff. This time, it was the economic recession that precluded the administration of a comprehensive law on water (British East Africa Protectorate 1923).

In 1926, a water legislation specialist from the Union of South Africa, A.D. Lewis, was invited to make recommendations based on an investigation. Although Lewis and Sikes did not fully agree on all details, they both concluded that the common law was totally inadequate for Kenya (Lewis 1926; Sikes 1926). Pursuant to Lewis's recommendation, a Water Legislation Committee was formed, which presented a Water Bill for a comprehensive water ordinance in 1928 (Water Legislation Committee 1928).

This Bill came under heavy fire from white farmers with vested interests in water rights. In 1928, the settlers' spokesman, Dr. William Dunn, publicly criticized the State for breaching its own lawfully existing contracts with its citizens, since the Bill provided for state ownership of all water, including all subterranean waters, on the crown lands. To the settlers, this was tantamount to confiscation of property and 'bolshevism' (Dunn 1928). Ultimately, the proponents of the water law had to yield. A revised Water Bill was published in 1929, which was acceptable to the settlers, and the Legislative Council passed the bill in December 1929. To satisfy the white settlers, the control and ownership of groundwater had been left out completely. The bill vested all surface waters in the state and gave the authority for managing and enforcing the water law to a new government body: the Water Board. All water use—except for minor, domestic uses—had to be granted through a permit from the Water Board. To some extent, riparian rights were protected; water for domestic use required no permit and the Board was also to protect the interest of downstream users (Draft Water Ordinance 1929).

All that was needed for the Water Ordinance of 1929 to become effective law was an official assent by His Majesty the King in the United Kingdom, which was sought in February 1930 (Deputy Governor of Kenya 1930). In July 1930 the Secretary of the State, Lord Passfield, responded that he did not see himself in a position to recommend his Majesty's assent. The main reason for this outright veto from the Colonial Office was that under the proposed legislation the rights of the Africans living on native reserve lands were not sufficiently protected. The Secretary of State demanded that the ordinance be revised. All activities affecting waters in native areas should be subject to approval of the Native Lands Trust Board, the authority in charge of protecting the rights of 'natives' as laid down in the Native Lands Trust Ordinance (Secretary of State for Colonies 1930).

New water legislation that had been painstakingly developed over 15 years therefore had to await resolution of the issue of Africans' rights to water. The question was referred to the Kenya Lands Commission in 1934. It stated that all areas should be under the jurisdiction of the Water Board. The Native Lands Trust Board, who legally acted as a trustee for the Africans, should be regarded as any riparian landowner (Director of Public Works 1934; Governor to Secretary of State for the Colonies 1934). This interpretation apparently satisfied the Colonial Office. In December 1934, the new Secretary of State, Mr. Cunliffe-Lister, forwarded his Majesty's assent to the Water Ordinance of 1929 (Secretary of State for Colonies 1934). On July 1 1935, Kenya's first water legislation finally came into effect.

Even before the Water Ordinance was effective, the state expanded its role steadily. State involvement in urban water provision picked up in the 1920s, either through the Public Works Department or through local authorities. In 1922, the Uganda railway handed over responsibility for water supply in Nairobi to the municipality. The privately owned Muthaiga water supply on the outskirts of Nairobi also was taken over by the local authority (Kenya 1913–1923). The railway continued to be engaged in water supply throughout the 1920s, but on a diminishing scale. By 1931, the Public Works Department operated 11 township supplies in various parts of the country (Colonial Office 1933). Between 1920 and 1945,

the Kenyan government had taken large strides towards a state-led water regime. The state had taken charge over urban water supply in the country, put in place a new legislation with state supremacy over all surface waters, and sunk more than 500 boreholes in rural areas (Public Works Department 1950). In fact, this formative period moulded a public water regime that would remain until the recent reforms.

7.3.3 State Hegemony (1946–1985)

After the Second World War, Kenya increased its investments in social and economic infrastructure. Assisted with British grants from the Colonial Development and Welfare Funds, the Kenyan government allocated over £15 million over 10 years to boost development and about £1.2 million was dedicated to water development (Colonial Office 1950). This resulted in the rapid expansion of the state's activities in the water sector, which can be illustrated by the number of boreholes sunk, which went from less than 50 per year in 1931 to 150 by 1950.

State expansion of services in urban and rural areas increased even more: from a dozen public water supplies before World War II to 85 by the end of the 1950s. The local authorities in the largest towns were given responsibility to manage their own water supplies, while in the smaller towns the service provider was normally the PWD (Nilsson & Nyangeri 2008). However, the colonial government's ambitions for development banked on an expanding agricultural sector. According to the colonial government, water development was 'the biggest single factor in agricultural progress, increased production, and the increased human and animal carrying capacity of the land' (Council of Ministers 1957: 2). The agricultural expansion now called for better control of the colony's water resources.

Accordingly, a revised Water Ordinance was enacted in 1951. This time, all groundwater was defined as state property. Furthermore, two new institutions were established instead of the old Water Board: the Water Resources Authority and the Water Apportionment Board. The Water Resources Authority advised the Minister in charge of water on all policy and development matters, while the Water Apportionment Board issued water permits. In addition, to ensure that the water resources were efficiently utilized and conserved, a Regional Water Board for each of the major river basins was established to advise both the Water Resources Authority and the Water Apportionment Board. Kenya could thus be said to have pioneered the idea of catchment-based water management.

In 1963, the newly independent government took over the statutory water institutions from the colonial administration. Gradually, a series of organizational changes were made. The Ministry of Natural Resources took overall charge of water in 1964 and in 1968 responsibility was transferred to the Ministry of Agriculture (Kenya 1966, 1969). In 1974, a fully-fledged ministry for water was established: the Ministry of Water Development (World Health Organization 1975). However, the main features of the colonial sector structure were preserved: local authorities were in charge of major urban water supplies while the central government tended

to smaller towns and rural water development. Mombasa was an exception, where water was supplied by the parastatal Mombasa Pipeline Board.

In 1972, the old Water Ordinance was replaced by Cap 372 of Laws of Kenya. Most of the institutional framework for water, however, was left unchanged. There was still state ownership of all water, and the Water Resources Authority and the Water Apportionment Board were kept but were supplemented by stronger regional authorities. These catchment-based Regional Water Boards and Regional Water Committees were to give advice to the central authorities and to initiate development from a grass-root perspective. For urban water supply, the old system was left intact: the Minister appointed a 'Water Undertaker'—generally the Ministry itself or a local authority—which was awarded a service monopoly for a given area. All tariffs and service undertakings would be specified in regulations that the ministry supervised.

The subsidiary Water (General) Rules of 1972 illustrated that the Cap 372 did not break away from the old colonial institutions. Almost 10 years after independence, the permit application form appended to the Rules still stated that the normal allowance for water supply was 50 gallons/day for non-Africans and only 10 gallons/day for Africans. Nevertheless, some important changes had been made such as an increased focus on water resources management. On the whole, water conservation and environmental protection were gradually given more attention in the revisions of 1953 and 1972 (Water Undertaker Rules 1953, 1972).

Another long-term change in the institutional framework was the ever-increasing political control over water policy and water development. Each water law provided for an advisory body that would assist the Minister with policy and the implementation of the legislation. The formal influence from the technical wing of the government over the advisory bodies decreased over time, while the powers of the Minister increased. In 1929, there were ten members in the Water Board and the Director of Public Works was the Chairman. In 1951, the Water Resources Authority (successor to the Board) comprised twelve members, of which one should be the Director of Public Works. The Water Resources Authority was expanded in 1972 to 17 members, out of which the Minister directly appointed 13, but none of the seats was earmarked for the technical wing of the government (Water Ordinance of 1935; Water Ordinance No 56 of 1951; Water Act of 1972).

At the same time, the role of the central government in water supply and development increased throughout the 1970s. From around 1970, the Government expanded its development budget heavily in order to achieve the ambitious policy goals of 'Water for all by 2000'. However, from the mid-1970s, the slowdown of the economy and the deterioration of the financial situation caused most of the budget increase to be eaten up by inflation. Furthermore, the principle of cost recovery from users, which had been practiced by the colonial government, was abandoned. Although the official policy still professed the principles of cost recovery at least for urban water supplies, in practice cost recovery was dropped in the 1970s (Nilsson & Nyangeri 2008).

Kenyan politics after independence has seen frequent interference by the Presidency (van de Walle 2003: 302). In 1981, a Presidential decree abolished

payment of water tariffs based on metering in rural areas, in direct conflict with the Ministry's policy (Kenya 1984). Furthermore, decentralization of responsibility for water development embodied in the 'district focus reform' in 1983 also increased Presidential control at the expense of line ministries and Parliament (Barkan & Chege 1989: 446–48; Southall & Wood 1996: 508–10). Throughout the 1970s and 1980s, the water sector was characterized by poor financial performance and services could not be expanded as planned. The government was unable to uphold its promise of 'Water for all by 2000' (Nilsson & Nyangeri 2008).

7.3.4 The Market Strikes Back? (1986–2008)

The role of the state was slowly rolled back from the second half of the 1980s. The government's Sessional Paper No. 1 of 1986 on Economic Management for Renewed Growth marked a turnaround in public sector policy (Kenya 1986). Under this new policy, the Government was to develop new strategies for providing basic services that would accelerate economic growth. Serious public sector reforms were to be put in place including the management of water supplies. In 1988, the National Water Conservation and Pipeline Corporation was established as a State Corporation. Some urban water undertakings were transferred to it in order to operate them on a commercial basis (Nyangeri 2003).

In 1992, the Ministry of Water Development released two important documents that continued to guide the sector up to the end of the decade, the 'Delineation Study' and the National Water Master Plan. The Delineation Study defined and improved the delineation of the roles, functions, and responsibilities of the principal actors in the sector. The National Water Master Plan set out long-term plans for the much-needed reforms in the management and development of the water sector. One of the most important recommendations to come from the two reports was that the ministry should develop a water policy (Japan International Cooperation Agency 1992). This Water Policy (Kenya 1999) is the blueprint that has since then guided legal, administrative and investment reforms in the water sector. The policy paper was specifically meant to (a) Provide overall guidance for the country's water resource management, water supply, sewerage development, institutional framework and financing of the water sector; (b) Propose institutional reforms that separate water resources management from water services provision; and (c) Outline the separation of policy, regulatory and operational functions within the sector.

The new institutional structure, as envisaged in the Policy, had also to be manifested in new water legislation (see Fig. 7.1). In 2002, the new Water Act was passed in Parliament. Under this Act, the ministry mainly deals with policy and legislation, and seven regional Water Service Boards were to be created to be responsible for water and sewerage services. An independent Water Services Regulatory Board will approve tariffs and also develop standards and guidelines and supervise the Water Service Boards. The Water Service Boards will in their turn contract operators, called Water Service Providers, for the actual service delivery. These Water Service

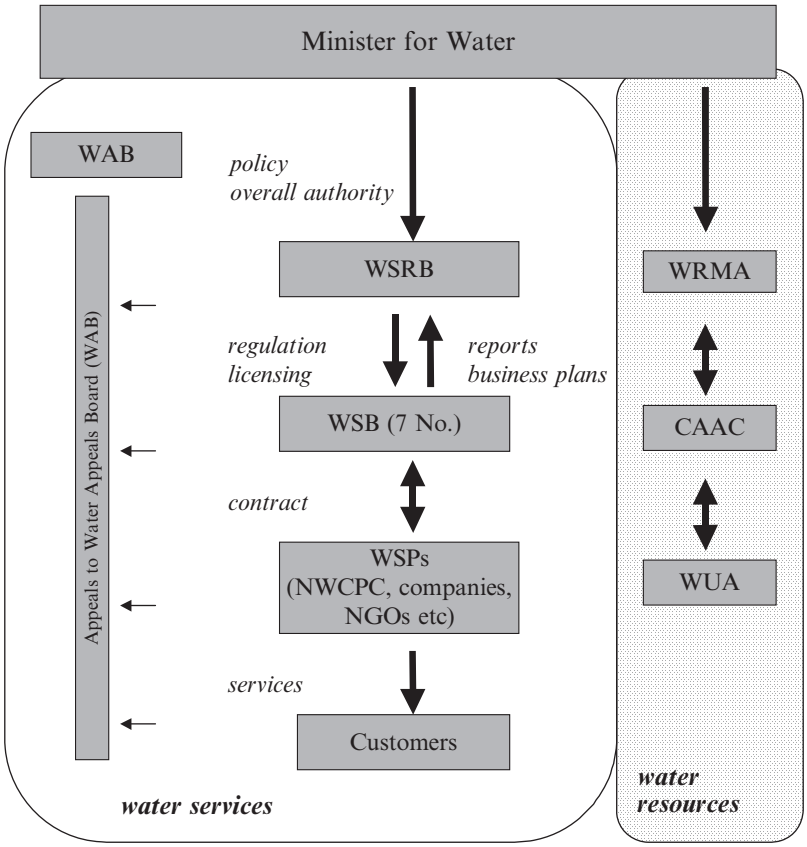

Fig. 7.1 The new sector structure for water supply in Kenya

Providers shall—as explicitly stated in the Act—operate on commercial terms. The local authorities are no longer allowed to operate their supplies themselves, but they are not prohibited from owning companies that may act as Water Service Providers. Another important shift in the Act is the separation of water services from water resources management. Water resources will be governed by the Water Resources Management Authority, with subsidiary Catchment Area Advisory Committees and Water Users Associations that may influence water resource allocations and provide stakeholder involvement (Kenya 2002).

The new institutions are yet to be put to the test, as reorganization of the sector is still going on and progress of the reform has initially been slow (Kenya Water & Sanitation Programme 2006a). The implementation of the new Water Act has been marred by institutional and organizational setbacks in relation to the role and autonomy of the Water Services Regulatory Board, retrenchment of ministry staff and principles for tariff setting (Nilsson & Nyangeri 2008; Nyangeri 2004).

Furthermore, the legal status of municipal companies acting as Water Service Providers is not clear (Kenya Water & Sanitation Programme 2006b). In addition, the effective autonomy of municipally owned water companies in Kenya can be questioned and political interference is still rife (Nyangeri 2004). Although no legal framework can be completely waterproof from the start, it is obvious that the new Water Act of 2002 still has quite a number of leaks to seal for it to stay afloat.

7.3.5 The Evolution of Water Regimes in a Regional Perspective

This section discusses the broader regional context in the light of Kenyan experiences. East Africa and its water institutions is, as noted previously, not entirely a homogenous study object. There have been differences through history, some which have influenced later developments in the countries. For example, provision of urban water services in colonial Uganda was being done exclusively by the central government's Public Works Department, while this responsibility was largely devolved to local authorities in Kenya (East Africa Royal Commission 1955). To a large extent this is still the case. In Uganda, urban water services still remain in the hands of central authorities, while in Kenya this responsibility is more decentralized (Ballance & Trémolet 2005). The pre-colonial water institutions in East Africa had similar features and so had the colonial water regimes. Ongoing sector reforms in East Africa also follow similar paths; towards increased cost recovery, private sector participation and commercialization of services (Bayliss 2003; Kjellén 2006). The road towards reform in East Africa has, however, been anything but smooth, particularly regarding private sector involvement (Ballance & Trémolet 2005; Kjellén 2006). Although these reforms may aspire to start afresh, much still seems to be the same.

7.4 Continuity and Change: Some Conclusions

This section sums up the key features of the long-term changes in East African water institutions. Today's institutions in Kenya, and elsewhere in East Africa, may appear so different from the traditional water regimes that a comparison would seem pointless. Today's system, the colonial regime, and the traditional regime, however, are all social responses to physical, political, and economic contexts. In the traditional East African society characterized by physical and environmental insecurity, it was perfectly rational to allow everyone to have access to all water resources, as this would reduce risk for the society as a whole. Consequently, water was a commonly held resource although not necessarily an open access resource. Certain rights could also be acquired for groups or individuals in order to create incentives for investment in, and the protection of, water resources. With the introduction of

the colonial state at the end of the 1800s, agriculture became the cornerstone of the economy and to attract white settlers, land was seized from the traditional societies and parcelled out to the settlers. Soon the settlers started competing for the water. In the wake of an efficient system of property rights and allocation of water, the farmers settled their conflicts through the system to which they were accustomed from their tradition: through court decisions under the common law.

The problems of conflict over, and inefficiency in, water allocation prompted a new water regime in the 1920s, in which state ownership of all surface water was established. Water was allocated through applications and permits in the interest of the public, although 'the public' essentially meant the colonial elite. The state took a leading role also in provision of domestic water supply, especially in the growing urban areas. The main reason for this was public health concerns. Under the dual legal and administrative regime that had been established under colonial rule, the state focused mainly on serving the non-African population. This led to dual standards in the water regime as well and has major implications for the post-independence period.

Due to the dual standards applied previously, social equality became a strong motive for state involvement from around 1970. On the other hand, cost recovery was not enforced, rendering the sector financially unsustainable. Technology choice and service standard levels did not change significantly, at least in urban areas. The persistence of costly technologies aggravated the financial situation, causing service expansion to stall. In summary, the independent government tried to achieve a new public objective—social equity—using the old regime, including conventional and costly technologies. Because the old colonial water regime was built to cater for small and economically strong elite, however, it did not easily lend itself to this new objective (Nilsson & Nyangeri 2008). It is also possible that the customary regime—under which water was not a commodity—has had an influence on consumers' willingness to pay for water in recent times. Changing the formal statutory institutions is relatively simple, but changing informal institutions and behaviour takes much longer time (North 2005).

The most recent reform in Kenya is basically about restoring the financial sustainability of the sector. The new structure should provide better incentives for cost recovery, but it is questionable whether the new structure is likely to improve service coverage to poor people. The new Water Service Providers and Water Service Boards have only made limited efforts towards a realistic plan for increased coverage (Kenya Water & Sanitation Programme 2006a). Water Service Boards are regional government bodies and it is questionable whether they will prove more accountable to poor citizens than the local or central governments have been before them. Some concepts that have been marketed as 'new' in the current sector reform in Kenya have, in fact, been part of previous water regimes. For example, private sector participation was common before World War Two. Separation of water supply and water resources functions, including establishment of a catchment-based authority for water resource management, was institutionalized already in the 1950s. Moreover, full cost recovery was the key principle throughout the colonial period.

Although there have been several institutional reforms over the decades, the water institutions in the region today carry a heavy legacy of previous regimes. They are a cocktail of customary institutions, remnants of colonial regimes, and post-colonial socialistic approaches, fused with neo-liberal ideas. The gradual build-up of state responsibility that took place from the 1920s to the 1950s signifies the most dramatic institutional shift in East Africa since the pre-colonial time. The most difficult challenge still lies ahead for the East African states: to use this supreme responsibility in such a way that increasingly scarce water resources are used to the benefit of the common man—the *wananchi*—of East Africa.

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Chapter 8
Israel: The Evolution of Water Law and Policy

Richard Laster and Dan Livney

Abstract Israel's water law and its administration warrants scrutiny for its exceptional foresight, depth, and flexibility. The State of Israel was created in 1948 and a decade later the parliament (Knesset) passed four water laws that cover all aspects of water use and reuse. The laws' motif is that water is a national resource, owned by the people and held in trust by the Government for the benefit of the people. This type of legislation could not be passed today as paternalistic approaches have given way to a focus on individual rights and responsibilities. While privatization and long-term planning have changed water administration, the basic legislative infrastructure remains in place today as a comprehensive code worthy of study and imitation.

Keywords Israel • Middle East • water • water law • water policy

8.1 The Legal Inheritance

The land of Israel has been governed throughout recorded history by continuously changing governments and rulers. Each regime applied water law principles customary to their system (see Chapter 4, Laster et al. and Chapter 2, Kornfeld, this book). This chapter covers the period from the beginning of the British Mandate in 1917 until today. The Mandate did not make a complete break from the past. The British Mandate Government enacted the Palestine Order-in-Council in 1922, keeping Ottoman law in force unless modified by enactments of the British High

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Commissioner, the King of England, or the British Parliament. The newly formed legislature of Israel enacted similar legislation in 1948, the Law and Administration Ordinance that declared that the laws existing in Palestine continue in force, subject to enactments of the new legislature and subject 'to such modifications as may result from the establishment of the State and its authorities' (§11). These two laws embedded Ottoman Law and British Common Law in the roots of Israel's water laws.

8.1.1 The Mejelle

The *Mejelle*—the Civil Code of the Ottoman Empire enacted in 1858—declared that water, like grass and fire, was a free good, jointly owned by the public (§1234). No one may obtain private possession of groundwater (§1235), lakes, the seas (§1237), and large rivers (§1238). Use of such waters for irrigation and drinking is allowed to all (§§1264–1266), provided no injury is committed to another user (§1265). A river (§1239) or well (*Hussein v. Mour'I* 1934) found entirely within the boundaries of one or several landowners belongs to those landowners giving them the right to restrict its use. Yet this right does not bar the creation of an easement to use (§1268), nor does it extend to the groundwater itself. The *Mejelle* permits anyone to dig a well and withdraw water for his or her needs, even if such withdrawal lowers the water table in a neighbour's well (§1268). Further, the *Mejelle* provides that ownership of a well carries with it ownership of the surrounding land (§§1281, 1286).

The *Mejelle* does not allow an easement to pollute and forbids the construction of a cesspit or sewer near a well or water channel, which may contaminate its waters. On failure to remove the injury, the cesspit or sewer are to be closed (§§1212, 1224). There are no provisions for rerouting the sewage in case of closure, however, nor does the section apply to all contamination of natural bodies of surface water. The State must clean public rivers (§1321) and landowners must clean private streams (§1322). This latter section also defines the order of payment among appropriators for cleaning the stream's waters. It apparently refers to the removal of debris from wadis, however, and not to the building of sewage purification plants.

8.1.2 British Mandate Law

The League of Nations created the British Mandate in 1922, proclaiming that the Government 'shall have full power to provide for public ownership or control of any of the natural resources of the country…' (Palestine Mandate Resolution 1922: art. 11). In order to emphasize this point and compensate for Ottoman failure to establish a beneficial and effective administrative framework, the Mandate Government passed the 1940 Amendment to the Palestine Order in Council of 1922 that vested national surfaces water in the Government (Shaw 1946, I: 391). The Amendment and follow-up regulations severed all private rights in surface

water and conferred power on the Water Commissioner to restrict rights of use in all water sources in controlled areas (art. 16E).

Subsequently, three laws were drafted to control drainage, water rights, the use of surface water, and to enable the Government to study and control underground water resources respectively. The last two bills faced opposition from the Yishuv, the Jewish community in Palestine, who aborted any attempt by the Mandate Government to control the water supply, especially to agriculture (Shaw 1946, I: 392–97). The Government was successful in enacting legislation on water supply for non-agricultural usage. The Safeguarding of Public Water Supplies Ordinances No. 17/1937 and No.20/1938 enabled the Government to control water resources and ensure adequate water supply for domestic use, and to restrict the construction of wells or other operations likely to interfere with a public water supply without a license. Under the Safeguarding of Public Water Supplies Ordinance No. 20/1938, the Government assumed the power to drill on private land in order to conduct hydrological surveys. In the event of the discovery of water, the High Commissioner may expropriate the land containing the borehole. Subsequent surveys revealing serious problems of groundwater salinity due to over extraction were ignored (Shaw 1946, I: 395). Water quality provisions for purification of water at the supply stage are included in the Public Health Ordinance of 1940, still in effect today.

English expertise on drainage control and flood prevention is reflected in the 1941 Flooding and Soil Erosion (Prevention) Ordinance (Kendal and Baruth 1949: 14). This authorized the declaration of special areas, within which authorities could regulate farming and grazing (including banning them), forbid the cutting or burning of plants, and carry out related work projects. In 1942, the Drainage (Surface Water) Ordinance was adopted to create the position of a Water Commissioner to 'construct, maintain and control drainage works within any part of Palestine…' The Act enabled the Water Commissioner to prepare and execute drainage schemes, and to remove all obstacles to drainage work.

Municipalities were required to provide drinking water sewage and drainage services under the Municipal Corporations (Sewerage, Drainage and Water) Ordinance of 1936, but only upon request by the High Commissioner. The Cities Building Ordinance of 1935 required the municipal authority to plan for sewerage, drainage and drinking water for its residents. In small towns or rural communities, the Public Health Ordinance of 1940 gave the District Commissioner the power to require a village authority to provide and maintain drainage and water supply services sufficient for public and private purposes (¶64). Disposal of sewage was a local affair, partially supervised by the central Department of Health and the District Governors. Reference to sewage disposal works in the ordinances implied only the location of a sewage outfall, without any provisions for the purification of sewage. By this approach, towns were encouraged to convert streams and wadis into carriers of waste. The only ordinance that directly aimed at pollution prevention is the Criminal Code Ordinance (1936), which prohibits the intentional fouling of a spring, stream, well, or reservoir on pain of imprisonment of up to 3 years (§198). In addition, the Public Health Ordinance requires the abatement of nuisances in water sources that may be injurious or dangerous to the public health (§§53–64). Both ordinances are still in effect today.

British judges in the Mandate used English common law and riparian rights as much as Ottoman law to decide cases. Disputes over water rights were brought before Land Courts because under the common law water rights are linked to land ownership (*Mutawalli Shazletti Waqf v. Municipal Council of Acre* 1940). Depletion of a water source, or damage caused by diversion of surface waters, was considered as nuisance, justiciable in the District Courts (*Aashsash v. Scheller* 1932).

8.1.3 The Early Years of Statehood

Before independence, an ideological movement gathered momentum amongst the Jews in Palestine and Zionists living in the Diaspora, proclaiming the importance of a strong working class, including a return of the Jews to working the land. They later formed the Labour Party, which ruled continuously from 1948 to 1977 and intermittently in later years. Agriculture-based settlements, called *kibbutzim*, sprang up throughout the country. The *kibbutzim* played a major role in the young economy, providing jobs, food, and foreign currency. Part of the ideology of return to the land included making the desert bloom, by using novel farming and irrigation methods to increase arable land and developing numerous desert forestation projects. At the same time, a strong centralized government-in waiting led by David Ben Gurion included government-owned industries and a national labour union (*Histadrut*) with open membership. The *Histadrut* provided health and social services to the workers, created an agriculture marketing cooperative, a bank, and a large construction company. Between 1948 and 1952, 687,000 immigrants arrived, doubling the Jewish population and making the centralized economy essential for providing homes and jobs.

The State's legal inheritance, the *Mejelle* as incorporated by the British Mandate, gave the new government of Israel a free hand to set water policy without the encumbrance of private rights in water. Agriculture, with its almost mythic control over the new government's economy and ideology, served as the lynch pin for government water policy, and a propensity for strong central government control over the economy found its imprint in water legislation. Converging, these historical factors laid the basis for Israel's water policy for generations—with government controlling the country's water resources exercised through the Ministry of Agriculture.

8.2 The Modern Legislative Framework

Between 1955 and 1959 four water laws were enacted. These laws maintained the spirit of the *Mejelle* by affirming the universal right to water, while incorporating central control and supervision of water sources, as the British Mandate authorities had advocated. All four laws are still in effect today.

The Water Measuring Law of 1955 declares that no water may be distributed in Israel without first being measured. Although the law initially recognized private rights in a water source (subsequently abrogated by the Water Law of 1959), the Ministry of Agriculture was empowered to require the measurement of water consumed from an independent source (§4). A regulation under this law requires abstractors to file monthly reports on water consumed or supplied with the Water Commission.

The Water Drilling Control Law of 1955 provided that no wells may be drilled and no water abstracted unless by government permit (§4). The law empowers the Water Commissioner to refuse a license request if a new well will harm groundwater, or interfere with household water supply (§5). The law empowers a magistrate court judge to close any well dug without license from the Water Commissioner (§11a).

The Drainage and Flood Control Law (1957) created a national drainage board and regional drainage boards. The former advises the Minister of Agriculture responsible for execution of the law and approving regional drainage plans. The latter are independent bodies, comprised of representatives of local and national government, entrusted with the power to prevent soil erosion and promote orderly drainage. This Law also empowers the Water Commissioner (now called the Director of the Water Authority), the Minister of Agriculture, and the regional drainage boards to declare areas around water sources as protective zones (arts. 4–7, 18; *see also* Water Law 1959: arts. 14, 15).

The Water Law of 1959 opens with several declarative sentences that have been promoted by the Supreme Court to an almost constitutional level. This Law declares that the domestic water sources are the property of the people and are to be managed by the State for the needs of the people and the development of the country: 'A person's rights in land do not provide him with rights in a water source which is on the land, flows past it, or its borders…' (arts. 1, 9). No one has the right to water supply if that supply reduces or salinates a water source (art. 4). Every person has the right to water, so long as this does not harm the quality or quantity of the water source, but that right must fit into one of the categories of water usage listed in the law: household, agricultural, industrial, handicraft, commerce, and services and public services (art. 5). An amendment in 2004 added protection and reclamation of nature and landscapes to the approved purposes (art. 6).

The Water Law defines water sources as 'springs, streams, rivers, lakes and other currents and accumulations of water, whether above ground or underground, whether natural, controlled, or manmade, and whether water rises, flows or stands therein at all times or intermittently, and includes drainage water and sewage water' (art. 2). By expanding the definition, the law provides for the protection of all existing and potential sources of water.

Initially, ministerial responsibility over the Water Authority and the water laws were entrusted to the Minister of Agriculture. At that time, agricultural water use was deemed of utmost importance, and agriculture was (and still is) the primary consumer of water—some 68% in 1986, falling to 56% in 2003 (Central Bureau of Statistics 2006: 73). All subjects related to water use were in the hands of the minister of Agriculture; which is no longer the case.

The law creates a Director of the Water Authority (the Director) 'to manage the water affairs of Israel' (art. 138). The Director determines who gets water at what quality and quantity. Each water abstractor/supplier requires an annual license. The Director determines river flows and ground and surface water levels. He chairs the National Drainage Board and determines rights along drainage channels. He is appointed to a 5 year term by the government rather than by any one minister responsible for the Water Law, thus making the Director the real authority in the decision making process. His powers provide the flexibility needed in managing Israel's highly developed water system. The law creates a Water Authority to set policy and advise the Director (art. 125), establishes a national water supply company (art. 46), and a Water Court, where claims for unjust supply or other complaints against the Director are filed (art. 140). The Director has the power to require any person polluting a water source to repair the situation within a reasonable amount of time at the expense of the polluter (art. 11).

8.2.1 The Courts

There are three tiers of courts in Israel: the Supreme Court, the District Court and the Magistrates Court. Magistrates and District Courts deal with civil suits and criminal cases. Jurisdiction before these courts is determined by size of claim and by severity of punishment. The District Court serves also as an appellate court for the Magistrates Court. The Supreme Court functions both as an appellate court and as a High Court of Justice. In this latter capacity, it deals with administrative and constitutional issues, exercises judicial review over the other branches of government, and gives relief in matters where no other court has jurisdiction. In order to relieve the caseload of the Supreme Court, the Court of Administrative Matters was created in 2000. Acting through the District Court, the Court of Administrative Matters hears appeals of decisions of local planning authorities (not regional or national authorities), claims of damages resulting from public tenders, and certain administrative petitions and appeals. There are also specialized courts: religious, military, juvenile, labour tribunals, traffic, etc.

The Water Court, created under the Water Law, sits on all matters referred to it by the Water Law and the Drainage and Floods Control Law (Water Law 1959: arts. 140–147). Cases are heard by a three-member panel, comprised of a district court judge who presides and two representatives of the general public. Appeals from the Water Court are to the Supreme Court. The court focuses mainly on appeals of decisions made by the Director concerning allocations (art. 31), maintaining water quality and prevention of waste of water (arts. 9–13), as well as appeals against the Director or the Minister for Environmental Protection when acting to prevent water pollution or due to their refusal to invoke their authority to do so (art. 20R).

The High Court serves as an alternative legal venue to the Water Court, generally when the Director is only one of several defendants (*Israel Union for Environmental Defence v. Minister of Finance* 2006). The Water Court is not a legal

venue for cases of the Director against other parties, for example non-compliance with an order. These cases are heard in the Magistrate and District Court according to the punishment or size of claim. In some cases the presiding judges are not familiar with the authority vested in the Water Court, leading to the court hearing cases that are not within its jurisdiction and vice versa (*Miloban MCP Inc. v. Water Commissioner* 2005). In more complicated cases, it can be difficult to decide whether the Water Court has jurisdiction.

Until the 1990s, very few criminal cases were brought for violations of environmental law in general and water law in particular. Since then, the number of cases has increased, while simultaneously judges are invoking harsher punishments and assessing personal liability in addition to corporate liability. Most cases are brought by the Ministry of Environmental Protection, who has been particularly active in filing suits against local authorities (*State v. City of Ashdod* 2000) and dairy farmers (*Kibbutz Tzuba v. State of Israel* 2003) for polluting water sources.

8.2.2 The Environmental Revolution and Its Effects in Israel

The 1970 U.S. Clean Water Act and the 1972 United Nations Conference on the Human Environment in Stockholm inspired countries to reduce water pollution and recognize the amenity uses of water. On the eve of the Stockholm Conference, work began in Israel to amend the Water Law. The 1971 amendment defines water pollution in broad terms, making any change in a water source, *prima facie* pollution (Water Law 1959: art. 20(A)). The water polluter was also broadly defined as: '…any agricultural or industrial enterprise, any building as so defined under the Planning and Building Law, any installation, including sewage installations, any machine or vehicle whose placement, operation or maintenance or use thereof causes or might cause water pollution' (art. 20A). The amendment empowered the Minister of Agriculture, and after 1989 the Minister of Environmental Protection, to publish regulations to prevent water pollution in the following circumstances: (1) the siting of potential water polluters; (2) the use of certain products or processes, including agricultural produce and the use of fertilizers and pesticides; (3) the production, importation, distribution or sale of any product; and (4) the regulation of transport on or near a water source (art. 20A). The Minister can determine the siting of factories, their products and processes, their distribution and sales routes, all for the purpose of preventing water pollution.

The Water Law authorizes the Director to order any polluter to provide him with plans for sewage disposal. Once a plan is adopted and approved by the Director, no deviation is permitted (art. 20E). Failure to submit a plan or deviation from a plan can result in a fine, or loss of water supply, except drinking water (art. 20H). The 1971 Amendment prohibits the discharge of any substance into a water source, but the Director is empowered to issue discharge permits (in consultation with the Minister of Health) in two instances (art. 20K): if the discharge aims at improving

a water source; or if there is no choice but to discharge for a fixed time. A list of permits is to be open to the public, and a report of such permits is to be filed with the Economics Committee of the Knesset. The Director must file annual reports with the Economics Committee on the water pollution situation and his actions to prevent such pollution (art. 20U). The burden of proving non-pollution is placed on any party caught placing anything near or in a water source that might change the nature of that source.

The 1971 Amendment is an all-inclusive pollution prevention mechanism. Unfortunately, it fails to deal with the real problem of local authorities' sewage disposal. Although the operation of local authority sewerage facilities are not expressly excluded from the amendment, it is questionable whether the Director can effectively enforce these provisions. If a local authority emits sewage effluent into a stream without a permit, can the Director use his powers to cut off water supply to a city? Can the Director build a multimillion dollar sewage plant and then charge the city for the expense? The Director could bring criminal charges against a mayor for pollution, but this sanction went unused until the creation of the Ministry of Environmental Protection in 1988. The amendment also fails to require the Director or the Minister of Environmental Protection to act to improve water quality in place of administrative discretion. The Director may issue discharge permits or order sewerage plans, and the Minister of Environmental Protection may control the use of pesticides and fertilizers, but they are not required to do so.

Finally, governments should aim to improve the quality of water to enhance enjoyment by current and future generations, including the protection of water sources for conservation, recreation, and scientific uses. Yet the 1971 Amendment failed to include these beneficial uses among the Water Law's list of protected uses. Even after the 1972 UN Conference on the Human Environment in Stockholm, the amendment failed to include the public in the decision-making process and ignored the ecological requirements of water. In 2004, the Water Law was amended to include the needs of nature as a recognized purpose for water use (art. 6(6)). Even this amendment failed to mention protection of habitats and biological diversity, or require the Director to set criteria for environmental flows. Given the Director's past achievements, he will probably wait until challenged in court to set the needed criteria.

8.2.3 Authority over the Water Cycle

The Director, with authority to 'manage the water affairs of the State' (art. 138), has the power to determine who will get water in Israel at what quality and in what quantity and has a free hand to determine stream flow and the direction and use of all waters. Once the Water Law nationalized water sources, the private citizen has a right to water, but not from a particular source and not of a particular quality (*Local Council Pardess Hana v. Minister of Agriculture* 1964). Due to political pressure, the Director used his role chiefly as an administrator and not as an active protector. While located in the Ministry of Agriculture, the Director's actions were influenced

by irrigation interests, allowing the capture of the headwaters of Israel's streams and rivers and authorizing engineering enterprises to bring water from the North to the South, while ignoring his duty to protect natural water sources and to limit water extraction to sustainable amounts (Sitton 2002). The quality of the aquifers deteriorated, while wetlands were drained and sewage flowed unconstrained in the diminished streams and wadis (Ministry of Environmental Protection 2002). In response to criticism, the government decentralized the water administration among different authorities through patchwork legislation instead of developing an overall strategy for water use. In 2006 the Knesset passed legislation in an attempt to reunite the parts.

8.2.3.1 Local Authorities

The first break in administration of the water cycle occurred at the local level. In 1962, the Knesset passed the Local Authorities (Sewerage) Law to enable local authorities to build sewerage works in addition to their pre-existing function as the local water supplier. A local authority may (and upon the demand of the Minister of the Interior, must) install a sewerage system within its boundaries or within any part thereof. The law vests 'ownership' of sewerage systems in local authorities and thus gives them the power over use of sewage water, breaking the total control delegated to the Director.

Most local authorities have adopted laws to provide adequate treatment and disposal of industrial sewage in a manner that avoids health and environmental nuisances and the contamination of water sources. Local authorities, however, generally failed to properly execute the power granted them for water supply and sewage purification. Instead, local authorities used water and sewage tariffs to pay general expenses. Under pressure from the Ministry of Finance, the Knesset passed a privatization bill—Water and Sewerage Companies Act Law—in 2001. The 2001 law and its 2004 amendment require local authorities to either create a municipal company or a private company to own and operate the system (¶¶6, 6A). This should ensure that revenues generated are fed back into the water and sewerage infrastructure and not used for the local authority's other needs. A regulator was created to oversee the pricing mechanism determined by privatized water companies.

8.2.3.2 River Boards

In 1965, the Water Law's control over water sources was further reduced when the Knesset passed the Streams and Springs Authority Law to broaden the powers of the existing drainage authorities. The original law required the creation of stream authorities, although, when feasible, existing drainage authorities were to be transformed into a stream authority. Yet no river authority was created until 1988 (for the Yarqon River), and no drainage authority received powers of a river authority until 2001. The Director did not intend to share his powers with another authority and

the Minister of Agriculture supported this position. It took relentless pressure by the staff of the soon to be created Ministry of Environmental Protection to break this lock hold.

A stream authority is different from a drainage authority. First, a drainage authority only handles drainage and provides flood protection while a stream authority has the power to plan the ecological destiny of a particular stream. Once empowered, a stream authority can determine water flow, eliminate health hazards resulting from pollution of the stream, and provide recreational areas and parks in and near streams. Second, stream authorities have a more variegated composition than drainage authorities, being composed of representatives of the Government, local authorities within the stream basin, water consumer and supply organizations, and representatives of landowners whose property borders a stream or who use the stream for commercial uses. Drainage authorities are composed almost solely of local government representatives.

The creation of the first stream authorities marked a historical turning point for the protection and reclamation of Israel's polluted streams. For the first time, riparian and government stakeholders met together in a statutory framework to determine the ecological destiny of a stream. The stream authorities look at the river in a different light than the Director. For him, a stream is part of the water infrastructure, and if it serves to carry off sewage or surface run-off then it fulfils its purpose. For a river authority, a stream is a beacon to the local population for recreation. Only after the creation of Israel's stream authorities did emphasis switch from streams as waste carriers to recreation areas. This message was not lost on the drainage authorities.

8.2.3.3 Catchment Basin Authorities

A combination of catastrophe, jealousy and common sense encouraged Israel's drainage authorities to become river authorities. The catastrophic rains in 1991–1992 caused severe flooding and the criticism of the State Comptroller (State Comptroller 2004), and the Judge's gavel (e.g., *Menorah Insurance Co. v. Zevulun Valey Drainage Authority* 1993), knocked sense into the government's water policy. The Comptroller described the conditions in Israel's drainage infrastructure, indicating that drainage authorities failed to keep the channels and streams in proper functioning order and that the planning boards failed to 'see' the streams and flood plains when they issued building permits. The government was castigated for failing to appropriate funds for Israel's natural infrastructure and local authorities were admonished for failing to create development plans synthesizing town growth, urban run-off, and flooding. The government committee set up to execute a reform converted 26 drainage authorities to 11 based on catchment basin lines. The newly authorized drainage authorities created 'after the flood' opened their eyes to a new world—their size and increased budget gave them an appetite for more. Pushed by jealousy of the stream authorities, there began a slow process of converting the drainage authorities into stream

authorities. Two drainage authorities have also received powers of a soil conservation authority, with four more waiting in the wings. This will enable the drainage authorities to control agricultural activities within the catchment basins to reduce run-off and pollution.

8.2.3.4 Protection of Lake Kinneret

The development of the National Water Carrier turned Lake Kinneret (Lake Tiberias or the Sea of Gallilee), Israel's only large body of freshwater, into the country's main surface water reservoir. This added to the multiple uses of the lake for swimming, camping, fishing, religious observance, boating and tourism. The draining of the Hula Valley increased the nutrient load in the lake and withdrawals to the National Water Carrier reduced the lake's quality. In 1969 local residents banded together to protect the Kinneret, leading to the creation of the Kinneret Administration, a government-affiliated body without statutory powers. It served as a round table for statutory bodies to work together to protect the lake. In time the Kinneret Authority attached itself to the Kinneret Drainage Authority and joined its administration. Today both the Kinneret Authority and the Kinneret Drainage Authority are authorized by the newly created Kinneret Association of Towns to protect the beaches around the lake and to keep them open to the public, clean and free of pollution.

The Kinneret case serves as an excellent example of what effective basin management can achieve in preventing pollution and enhancing environmental quality. Unfortunately, the Dead Sea has not been provided the same protection. In fact, protection of the Kinneret Basin has been at the expense of the Dead Sea. Maintaining a full Lake Kinneret, while extracting over 300 million cubic meters a year, has blocked most of the flow of water that once flowed from Lake Kinneret down to the Dead Sea. Salt springs and sewage that flowed into Lake Kinneret are now diverted around the lake and deposited into the southern Jordan River. There is no Dead Sea Authority to protect its well-being. Large areas of the Dead Sea in both Israel and Jordan have been handed over to giant mineral extraction companies, who have changed the landscape and the Sea, and contributed to the Sea's drying up.

Protecting only part of the Jordan River basin has caused a NIMBY ('Not In My Back Yard)' situation. The solution lies in the creation of a governance system for the entire basin. This is no easy task, in light of the basin being transboundary, requiring the cooperation not only of Israel, Jordan, and the Palestine Authority, but also of Syria and Lebanon (Laster et al. 2005; Chapter 16, Sabel, this book). The National Planning Council has decided to create a National Master Plan for the Dead Sea watershed; it could guide development of the area and safeguard the quality of the Sea and the surrounding region. Implementing it will be problematic unless the transboundary management problems are resolved.

8.2.3.5 Government Ministries

Up until 1972, the Ministry of Agriculture had sole authority to set water quality standards, including those for drinking water. In 1972, the Public Health Ordinance was amended to give the Minister of Health power to determine drinking water quality and a 1974 Amendment gave him the power to determine the quality of sewage effluent. According to regulations promulgated by the Minister of Health, treated wastewater used for the irrigation of crops may be used only on specific crops and only after sufficient treatment.

In 1971, an amendment to the Water Law gave extraordinary power to the Director to prevent water pollution (Water Law 1959: arts. 20–20Z). Sixteen years later, the Ministry of Environmental Protection was created and the portions of the amended Water Law relating to the protection of rivers, streams and other water sources from pollution were transferred to it. The only exceptions are establishing standards for the sanitary quality of drinking water and sewage, which remain the responsibility of the Ministry of Health.

With the creation of the Ministry of National Infrastructure in 2002, the Water Authority was transferred from the Ministry of Agriculture to the Ministry of National Infrastructure. This Ministry has administrative responsibility over Mekorot (the National Water Company) and the Sewerage Administration, formerly in the Ministry of Interior. The Ministry of Agriculture has retained control over the Drainage Law, regulation for watershed and flood zone land use and conservation, and over agricultural use of water.

8.2.3.6 Planning Authorities

The Planning and Building Law of 1965 created three tiers of planning commissions: local, regional and national. These commissions are to engage in positive planning of their sector of control, as well as prevent violations of planning decisions. Regional planning and building commissions are composed of representatives of the national government and local authorities in the region, with a majority of its members being representatives of ministries. The National Planning Council is a multifaceted body made up of over 30 members representing governmental ministries, local authorities, environmental and professional groups such as the Society for the Protection of Nature, architects' associations, and others. Planning boards have professional staffs, who are employees of the Ministry of the Interior. All proposed plans require the approval of the planning commissions, which includes a professional review, publication, citizen involvement, an open hearing for objections, and an environmental impact assessment process for significant projects. Planning commissions are also empowered to make positive plans, i.e. to plan certain areas for amenities, public open space, industrial parks, forests, etc. The National Planning Board may even determine population dispersal requirements, new towns, the creation of ports, highways and airports, in-flight patterns, etc. During the 1990s, the National Planning Council began the process of reviewing Israel's water sources and ordered two professional committees to develop plans for protection of Israel's water resources. A master plan

for sewage was approved in 2002. The plan declares areas for sewage collection, areas and guidelines for sewage treatment plants and reservoirs, and instructions and guidelines for sewage and effluent pipelines.

Much of the treated effluent which is not used in agriculture is used for replenishing the underground aquifers, with the soil acting as a natural filtering system. A statutory master plan passed in 2006 aims to protect groundwater sources by designating areas for aquifer replenishment and providing procedural guidelines. The plan includes guidelines for the protection of aquifers from pollution, desalination facilities, water plants, surface water reservoirs, underground reservoirs, supply and transport systems and drainage facilities. It should provide a long-term response to the country's water consumption needs in an integrated fashion. A national master plan for drainage was prepared for the purpose of protecting Israel's streams, both as drainage systems for the prevention of flooding and run-off, as well as maintaining them as an integral part of the ecology and landscape. Since 2001, master plans for desalination have been prepared both for individual plants and for a general planning framework. An integrated master plan for water to improve and coordinate the management of water sources, water supply, agricultural development, and environment protection is now in the approval stage.

8.2.3.7 Reuniting the Parts (2006–2008)

After years of fragmentation, a Knesset committee established to review the water administration published a report attacking the government for failing to encourage cooperation among the various arms of government to prevent pollution and control and better administer Israel's fragmented water administration (Knesset Committee Concerning Water 2002). The blame was laid on fragmentation, although the reasons went far deeper than just structural reform. Instead of trying to understand the underlying faults in the law, mainly its lack of enforcement by the Water Commissioner, the Knesset simply added more powers to more authorities. In addition, the Knesset failed to understand the water and land ethic being developed in other countries and the need for a catchment basin approach to water management.

The Water Commission and the Ministry of Finance jumped at the chance to change the state's water agenda and prepared legislation to grant as many administrative powers as possible to the Water Commission (Yaroslavitch 2006). The end result was the creation of the Water Authority with essentially the same duties as the previous Water Commission. The Law does not, however, solve the problem of fragmentation. The Minister of Health still has power over drinking water and sewage effluent quality, the Minister for Environmental Protection power over pollution control and the Minister of Agriculture drainage and flood control. An 'interesting' approach in the law is the transfer of power previously delegated to the ministerial level—the Minister of National Infrastructure—to the administrative level—the newly created Water Authority. The Water Authority will have power to publish regulations that the Authority itself will then execute. This attempt to be both legislature and administrator has been seriously criticized (Kislev 2006). It shows

the speed with which the law was drafted and passed, the lack of public overview, and an ignorance of constitutional law and the Attorney General's instructions on drafting subsidiary legislation. The Water Authority's controlling committee is composed of the Director, the Director Generals of four ministries (Agriculture, Environment, Interior and National Infrastructure), the budget director of the Finance Ministry, and two representatives of the general public.

8.2.3.8 Privatization

Privatization further compounded the fragmentation of Israeli water policy. Israel's water ethic, propounded by the Labour Party, was founded on three principles: the mythic importance of agriculture, a strong central government dictating economic policy, and abrogation of individual rights in water. When Labour lost its power over the central government, proponents of capitalism reached the water sector. Anything associated with government was considered inefficient at best, corrupt at worst. Much of Israel's government sector was privatized, starting with telephone and communications and then water, electricity, etc. Yet Israel's water sector actually operated smoothly and on the whole efficiently. The bulk supplier, Mekorot, supplied water at a decent quality and decent price to local authorities for supply to homes and business. Treasury officials found privatization of Mekorot to be a hard nut to crack, so they set their eyes on the municipal sector. Here there was no opposition because municipalities had often used income from water supply to pay salaries when in fiscal stress. Treasury officials demanded 'fiscal responsibility' at the municipal level by drafting legislation to require municipalities to privatize their water and sewerage infrastructure.

This revolution in Israel's water sector raises more questions than it solves. Although privatization is a tool, it became a goal in itself. Converting a municipal monopoly into a private monopoly does not encourage competition. This required the government to create a new regulatory authority to oversee the newly created water companies. This then is not privatization, but government control of municipal services, replacing the budgetary mechanism with a pricing mechanism. Finally, privatization of one branch of the water cycle does not allow implementation of an integrated system, thwarting sustainability and a holistic approach.

Today (2008), the following actors are involved in water management in Israel. The *Ministry of Infrastructure* oversees the Water Authority and Mekorot, thus having overall responsibility for bulk water supply and responsibility for implementing the new law establishing the Water Authority. The *Director of the Water Authority* has administrative responsibility for water supply and effluent permits and the quality of water sources. *The Water Authority* regulates the water sector, makes water policy, and writes rules and regulations concerning water production, pricing, supply, quality, usage, and incidents harmful to water. *Mekorot* supplies the majority of water in Israel, and is responsible for maintaining the National Water Carrier as well as pumping stations, pipelines and wells. It also operates one of Israel's largest sewage treatment plants and several desalination plants.

Additional water corporations, belonging to local authorities, also supply water in certain regions. *Local Authorities* are responsible for water supply and sewage removal (along with private companies as of 2009). The *Ministry of Environmental Protection* is responsible for the quality of water in nature, including streams, groundwater and floodwaters. *The Ministry of Agriculture* is responsible for agricultural use of water, drainage and run-off (through the drainage authorities) and soil conservation. *Drainage Authorities* are responsible for storm water and floods. Most have also been granted the powers to act as river authorities, with responsibility for river ecology and usage. Two have been granted the powers of a soil conservation authority, with four more on the way. The *Ministry of Health* is responsible for drinking water quality and effluent water quality used for an economic purpose. Administrative responsibility for treatment and use of sewage effluent is shared by the Ministry of Health, the Ministry of Environmental Protection, the Director of the Water Authority, the local authorities, and the planning boards.

Although water allocations are made annually depending on the amount of rainfall, political pressure and increasing demand has resulted in allocations that exceed annual replenishment. This unsustainable situation became acute during the consecutive drought years from 1999 through 2002 and 2005 through 2007, causing increased depletion and deterioration of water resources. The Government and the Water Authority came under severe criticism from the public for not taking action. The Government response was a decision to desalinate on a large scale and in 2002 approval was given for the construction of seawater desalination plants with a total capacity of 400 MCM/year. The first desalination facility was built at Ashkelon, with a capacity of 100 MCM and began production in August 2005. By 2010, three additional private desalination plants will be constructed along the Mediterranean which should provide approximately 15% of the country's present needs.

In 2002, the Director presented an 8-year transitional master plan for the water sector, representing a change in strategy from short to long-term planning. To achieve this, sources of water are being developed that are independent of annual rainfall patterns—desalination and usage of treated effluent. Water Authority policy calls for a reduction in freshwater usage by the agriculture sector to 530 MCM/year, with the reduced amount to be replaced by reclaimed effluents. Incentives include raising the price of water paid by farmers to the same level that local authorities pay for urban consumption and for compensating farmers for foregoing freshwater allocations, while being encouraged to switch to crops that are more appropriate for arid regions such as winter wheat cultivation and certain types of orchards (olives, almonds).

8.3 Conclusion

Israel's water administration has gone through several periods. The first period was characterized by central control of all uses of water and administrative authority in the hands of a water commission. Beginning in the 1970s until the 1990s the administration became fragmented, with power moving to other ministries and

administrative bodies. In 2006, a reversal of this process began. Yet the system still remains fragmented and will continue to be so for the foreseeable future. Modern bureaucracy requires that government agencies work together, as no one agency can control both Israel's water needs and meet nature's needs while maintaining water quality. As Israeli democracy continues to grow stronger, the administrative authorities must be more attuned to the people and the people more attuned to nature. This will require river basin authorities to set and implement priorities at the basin level while the central government continues to set national water policy and strategy. This strategy must include recognition that natural resources are limited, and every step taken outside the boundaries of sustainability harms the needs of the next generation.

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Chapter 9
Russia: Historical Dimensions of Water Management

Vladimir Kotov

Abstract Analyzing Russian socio-economic issues from a long-term perspective is justified by the major problems that will have to be faced in the future. Such an analysis discloses that Russian water management is regulated not only by rules of law, but also by the behavioural norms of the Russian economic system. Therefore, problems in Russian water management cannot be solved merely through changes in water law and management tools alone. The major problem is that Russian economic and administrative structures were seriously deformed. In order to address the problems facing Russia successfully, a deep understanding of long-term changes in their historical context and of the problems caused by inert institutions created at earlier stages is necessary. This chapter provides an overview of these problems and suggests possible solutions.

Keywords Communism • informal practices • markets • property • water law • water management

9.1 Introduction

Russian institutional structures for water management are dynamic, with many significant changes in water law and water management over the past century. The changes began in the pre-Soviet period, continued through the Soviet period, and are now in the post-Soviet period. A new Water Code (1995) came into effect more than a decade ago, but positive results are still rather negligible. The major focus of this legislation was on the short-term aspects dealing with how a rational system of water management could be shaped, what instruments will reduce water pollution, and how to increase the contribution of pollution fees to the state budget. This focus left important matters unattended: long-term changes in water law and in organizational forms of water management; factors defining the emergence, evolution, and decline of forms of water management and their interaction with political, social, and economic

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systems; changes in water policy, etc. Long-term changes in water management institutions in Russia can be a source for generalizations about the capabilities of political and economic regimes to promote change in water management.

A closer long-term look at Russian water management discloses a striking contrast between informal practices and formal regulations. Another important characteristic of Russian water management made evident by the long-term approach is the lack of universal practices, common to all strata of society. For example, the general public believes that access to waters should be open and free of charge. The elite have their own patterns of informal behaviour corresponding to their interests. The main result of such conflicts is paralysis of some water management tools. Only a long-term, historically sensitive exploration of these issues will allow a full understanding of where Russian water law and policy stands today, how it reached that position, and possibly where it needs to go in the future.

This chapter considers water legislation and water management in three specific periods: the pre-Soviet period (before 1917), the Soviet period (1917–1990), and the post-Soviet period (from 1991). The last period can be further divided into two sub-periods. The first centres on the Water Code of 1995 and the problems that arose during implementation of the new norms and regulations. The second sub-period started on 1 January 2007, when a new Water Code came into effect. This last will be an analysis of the future as there is not yet much experience with the new Water Code. It is possible, however, to forecast the dynamics of the predictable conflict between informal practices and legislation. That conflict already manifested itself during the previous periods and has left its legacy for the new Code. This analysis includes not only identification of specific water management trends in each period, but also identification of interconnections between various water management bodies in these historic periods.

9.2 Water Law in Pre-Soviet Russia

Russian legal scholars considered the water law of the late nineteenth century to be one of the most underdeveloped branches of Russian law. Water law provisions were spread throughout the consolidated legislation. Some were found in civil law, others in municipal, agricultural, forestry, and transportation law. The results were considerable discrepancies and frequent legal appeals. Until 1917, water law presupposed that water was an object of private ownership. At the same time, water law sought to ensure satisfaction of the needs of the population in general. The first prerequisite made water subject to the civil law, and the second a part of public administration. Therefore the goal of water law was to draw a divisive line between privately owned water and water in public use—a conflict that makes up a great deal of water history in Russia.

The question of water ownership and use for transportation was at the core of water law of pre-Soviet Russia. The major focus was on the use of waters as transportation routes, with comparatively less attention to other functions, such as agriculture and irrigation, even though these regulations were crucially important because irrigation was vital for the agricultural sector in southern Russia.

Three types of waters were recognized by Russian water law: (1) open sea; (2) coastal waters; and (3) internal waters, which in turn were subdivided into: (a) water available for public use, (b) water in limited private ownership; and (c) water in complete private ownership. Waters available for public use included navigable and floatable rivers (established by government decision). All Russians had the right of navigation and floating in such rivers. Regulations were obligatory on all individuals floating or navigating the rivers open for public use; other regulations limited the rights of riparian owners to use these rivers.

Waters in limited private ownership included all large and small rivers that were not open for public use, but were suitable for navigation or floating (even if only in spring floods). Riparian owners had no right to prevent other people from using rivers as navigation or floating routes, if navigation or floating were not obstructed by bridges, dams, barrages or other installations in operation. Waters flowing through or located on the territory of several owners were also in limited private ownership. The ownership of the river did not grant the right to own the water as such; the water belonged to all riparian owners, and they all enjoyed equal rights to it. Riparian owners had no right to divert the water if that would deprive others of the river's water. Water created legal relations not only among riparian users, but also among all landowners who needed to withdraw water. Those relationships depended on land ownership; they were determined by agricultural needs and were based on the balance of the interests of private owners and the general public.

At the end of the nineteenth century, some of the *guberniyas* (territorial subdivisions of Russia until 1929) changed the provisions on water use. The original provision was that ownership rights in water (in cases when water goes beyond the borders of one's own lands) are limited by the rights of other water owners using the water for the following purposes: (1) drinking and household use; (2) irrigation; and (3) operating industries. Each landowner was supposed to let the waters pass that were necessary to satisfy those needs. Water practices in towns and villages were established by the decisions of local water use assemblies. Each individual using water from irrigation channels participated in maintaining, repairing, and managing the facilities, either through payments or through voluntary labour. At the same time, peasants of steppe *guberniyas*, where artificial irrigation systems were used extensively, could use water for watering their orchards and gardens on the basis of the law that existed on the abolition of serfdom (19 February 1861), although new irrigation pipes could be installed only with the permission of the landlord (Dingelshtet 1880; Nikolsky 1883).

9.3 Water Management During the Soviet Period

It might seem that the collapse of the economic and political systems and the ensuing reforms of the 1990s destroyed the Soviet legacy completely. It may also seem that the new system was put together from scratch and that any vestiges of the Soviet system will disappear after a transition period. The Soviet period, however, played a significant role in moulding the water management bodies of today. The Soviet

water management system in turn inherited some features characteristic of pre-Soviet Russia, although people who came to power in 1917 hated pre-Soviet Russia and did everything possible to destroy the old institutions and to set up everything anew. Neither the revolutionary leaders of 1917, nor the reformers of the early 1990s, managed to break completely from the past. The institutions they inherited did not vanish completely; some were modified and included in the new water management structures of the successor system. Thus, the Soviet institutions are not doomed to extinction and will probably exist for quite a while. Knowing their strengths and weaknesses, as well as their problems, thus remains important. The following sub-sections outline the main characteristics of the Soviet system of water management.

9.3.1 Main Characteristics of Soviet Natural Resource Management

The institutional structure of natural resources management in the USSR was interlinked with its economic and political system as follows: (a) Access to natural resources was strongly limited: most natural resources were the exclusive property of the state; (b) The state held a monopoly over the use of natural resources; access to natural resources (excluding widely spread resources) was denied to actors who were not part of the state apparatus; (c) The regions (*oblasti*) did not have any influence on the management of most important natural resources; their role was insignificant, limited to following commands from the centre; and (d) Natural resource access for state enterprises was free of charge and unlimited in quantity.

This system created rapid and unlimited access to natural resources for the Soviet ministries and their enterprises; transaction costs of access were low. The advantages, however, were combined with a serious shortcoming: The State monopoly did not allow for alternative economic options, resulting in inefficiency for the whole system. State enterprises did not use possibilities they were granted effectively.

9.3.2 Property in Water During the Soviet Period

Water management during the Soviet period was based on the same fundamental principles as the management of most other natural resources. Waters were declared the exclusive property of the state. They were transferred to economic entities only for use. All types of water were included in a single state water fund, including: (1) rivers, lakes, water storage reservoirs, channels, ponds, and surface water reservoirs; (2) groundwater and glaciers; (3) inland seas and other inland waters; and (4) the territorial sea (RSFSR Water Code 1972: art. 4). The ceding of water use rights and all other transactions that violated, directly or indirectly, the right of state property in water were void. Persons found guilty of carrying out such transactions, as well as of unwarranted use of water resources, were subject to criminal or administrative responsibility (RSFSR Water Code 1927: arts. 109, 110).

The state monopoly on water had an important exception: Citizens were allowed to use water resources, with some significant limitations. The USSR thus borrowed some of the practices of pre-Soviet water management, which recognized water to some extent as a public good. The Soviet government declared that making water state property was meant to provide 'truly public control' over the use of water. Declaring water (and all other economic resources) state property was supposed to put into practice the dream about converting all types of ownership into 'the people's property'. This change was accompanied by yet another initiative, according to which water resources could be used free of charge—which corresponded not only to the provisions of Marx's theory, but also to the informal expectations of the general public. When the Soviet water management system, however, faced severe problems (including the scarcity of water resources and frequently occurring droughts), tackling the problems with its ideological tools failed.

9.3.3 Water Use During the Soviet Period

Only state enterprises and organizations, or collective agricultural farms, as well as citizens for their personal use, could use water during the Soviet period. Thus, water represented an important exception to the state monopoly on the use of natural resources in the USSR. Individuals were allowed to use water resources, but not to own them. They were limited to their personal needs, as private entrepreneurial activities in the USSR were strictly forbidden. The following types of water use were distinguished: general water use without any technical appliances and devices; and special water use with the help of such devices. General water use was allowed without any permits, while special water was to be authorized by specific permits (RSFSR Water Code 1972: art.18).

Water use was free-of-charge in the USSR, based on the ideology that value could be created only by human labour. Since no human labour was invested in creating rivers and lakes, there could be no charge for no value was being exploited (RSFSR Water Code 1972: arts. 22, 31). The right to use water could be granted to state organizations and enterprises for permanent or temporary use. Temporary use could be short-term (up to 3 years) or long-term (3–25 years). As periods of water use could be prolonged, temporary use actually represented a form of permanent (and free) use.

9.3.4 Competencies of the Centre and the Regions in Water Management

The central government had the following competencies regarding water (RSFSR Water Code 1972: art. 5): to administer the unified state water fund; to establish the main regulations on water use and the protection of water against pollution and

scarcity; to set up the national norms for water use and water quality, as well as the evaluation methodology; to establish the state water inventory and the water use inventory, water use registers, and the state water cadastre; to approve schemes for complex water use, water protection, and water balances of national importance, planning national water use and water protection activities; to exercise state control over water use and water protection; and to define water bodies, the use of which is regulated by the central authorities.

The Russian Soviet Federative Socialist Republic (RSFSR), one of the union republics of the USSR, had the following competencies (RSFSR Water Code 1972: arts. 6, 14): to administer the unified state water fund on the territory of the republic; to establish the order of water use and water protection against pollution and scarcity, and to plan water use and protection activities; to approve schemes of complex water use, protection, and balances; and to exercise state control over water use and protection.

Disputes between water users belonging to different territories or regions were decided by a committee consisting of equal numbers of representatives of the territories and regions involved. In case the commission failed to settle the dispute, it was to be adjudged according to a process established by the RSFSR Council of Ministers (RSFSR Water Code 1972: art. 86).

Despite these provisions, the legislation contained no clear-cut functional division of competencies between the USSR (the centre) and the union republics or other regional units of government. Instead, the competencies in the sphere of water management intersected. In the Soviet period, this was not a problem and it did not mislead anyone: All actual decisions on major issues were taken not by state authorities, but by the Communist Party of the Soviet Union guided by the principle of strong centralization. Authorities also considered the decisions of national bodies to be more important than decisions taken at lower levels. This centralized management of water use and protection was performed mainly by a special central ministry—the Ministry for Melioration and Water Economy of the USSR and its local branches (RSFSR Water Code 1972: art. 8).

9.3.5 Water Protection

Water could be used for waste discharge only with permission of the regulating authorities (RSFSR Water Code 1972: art. 74). Wastewater discharge was allowed when the pollutant's concentration did not exceed established norms and if wastewaters were treated by the water user. There was, however, a huge gap between the formally declared requirements and the actual state of affairs. Water protection areas and protective sanitary zones were established (RSFSR Water Code 1972: art. 98). Water protection was also included in national economic plans (RSFSR Water Code 1972: art. 93). When granting construction and water use permits, authorities were to comply with the schemes of water use, protection, and balances (RSFSR Water Code: 1972: art. 99). Water balances that assessed the availability and use

of water were drafted for basins, economic regions, union republics, and the USSR in general. General and basin plans defined major activities aimed at satisfying prospective water needs, as well as water protection (RSFSR Water Code 1972: arts. 105–107).

9.3.6 The Problem of Drought

Soviet economic activities involving water started with an ordinance 'On combating drought' (1921). Fighting drought continued to be a major priority into the post-World War II period, when the USSR introduced extensive irrigation. In 1946, with the country suffering a severe drought, the RSFSR Ministry for Agriculture established the Water Economy Agency. The government explained that water resource shortages resulted from uneven distribution of water resources throughout the USSR. The European part of Russia, with about 80% of the population, industry, and agriculture, has only about 8% of the total water resources. Large-scale canal construction was begun to redistribute the available water resources, with canals the size of large rivers.

Water resources grew more and more insufficient for satisfying the needs of the economy. In many regions of the USSR, this problem was seen as caused by wasteful water use, water losses, and pollution of surface waters. Enhancing the efficiency of water use became a priority, resulting in a decree of the RSFSR Council of Ministers 'On increasing state control over the use of groundwater and on activities aimed at groundwater protection' (1959). A number of normative legal acts were adopted in this period; many of them addressed not only the issues of water allocation and water protection, but also the question of rational water use. In 1970, the Supreme Soviet adopted a law on 'The fundamentals of water legislation of the USSR and the union republics' whereby everybody had to use water rationally (through regulating water flow by: constructing water reservoirs; inter-basin redistribution of water resources; and introduction of water saving activities in each basin), conserve water, and promote water quality enhancement. Other laws were also adopted.

By 1985, the USSR Ministry for Melioration and Water Economy included 26 research institutes, 68 design and exploration institutes, and 3,660 construction companies, which used about 90,000 diggers, bulldozers, and scrapers. The Ministry and affiliated institutions employed over 1.7 million people, but the Ministry was dissolved after the harsh reaction of Russians against its plans to change the course of the Siberian rivers. This organization and its activities in the Soviet times had a bad reputation. The democratic movement in Russia was one of the severest critics of those policies, using the Chernobyl catastrophe and the plans to change the course of the Siberian rivers as arguments against the Communist regime. Now we are witnessing a revival of plans for the Siberian rivers, reintroduced by Yuri Luzhkov, the Mayor of Moscow, who formerly was a leader of the democratic movement. The problem of drought became less acute after Russia

integrated into international trade, but it may become more threatening in the context of global warming.

9.4 The Post-Soviet Period: The 1995 Water Code

The reforms of the 1990s established a new legal regime for water management in Russia. A new Water Code was adopted in 1995. Its major elements were: State ownership ceased to be the only type of ownership of water resources; the state property in water resources in the Russian Federation does not equal state property under the Soviet regime; in contrast to the Soviet period, water users could be juridical persons as well as governmental organizations, ending the state monopoly over water utilization; the right on access to water resources depended on a licenses; natural persons preserved the right to use water resources and some significant limitations from Soviet times were abolished; and the mechanisms of water allocation were modified considerably, with price becoming a major feature.

Although in the early 1990s Russia underwent radical economic reforms, which should have implied the privatization of natural resources, formal ownership rights to water did not change significantly. Introduction of private property affected only a few waters of secondary importance. The state lost its exclusive ownership right, but kept its dominant position. At the same time, considerable shifts were made in distribution of responsibilities in water management. The federal government transferred some competencies to the regional level because of the transition from unitary to federal structures. Moreover, transformation to the market economy was translated in water management to the introduction of fees for water use. Corporate water users were to pay fees, whereas state and municipal organizations were exempt. Natural persons still enjoyed free access to water resources without paying fees, thus avoiding conflicts between the legal system and informal public practices. The authorities therefore could no longer control the use of waters as strictly as in Soviet times due to the lack of the necessary tools. Numerous water law violations by the general public went unpunished. Often, the authorities just shut their eyes to the violations. Aspects of these reforms and their consequences are summarized in the following subsections.

9.4.1 The Degradation of Water Resources

Surface waters are the source of drinking water supply in Russian cities. Drinking water degrades for two reasons. The first is pollution from, inter alia, the residential sector which dumps wastewaters into water reservoirs annually. The second is the high consumption of fresh water per unit of gross domestic product. Daily losses of water in residence water line networks alone amount to millions of cubic meters.

Measures to restore waters in Russia lag behind their degradation. As a result, the water deficit is increasing while water quality continues to deteriorate.

9.4.2 Water Property Rights Reform

The Water Code of 1995 reformulated water law. Water resources became subject to property rights. Water use was governed by civil and sanitary legislation. Isolated waters were included in real estate. State property in waters was established in the Russian Federation as in the former USSR, but with significant differences. State property in waters was no longer exclusive. The law recognized municipal and private property in waters. Individuals and legal entities could own isolated waters, i.e., small and non-flowing artificial waters, not connected with other surface waters. Waters that were state property could not be transferred to municipalities, individuals, or other legal entities. Waters could not simultaneously be the property of several owners. The reform of property in waters led to payment becoming a principle of water use and protection.

State property in waters in Russia remained the main form of property. Still, a great number of waters had no owners or their owners were not determined, and some waters were not formally registered as anyone's property. The water economy includes waters *per se* and installations in these water bodies. There are 30,000 barrages in Russia, less than 1% now in federal ownership. Some of these barrages are 300 years old. Most large barrages and reservoirs have owners, but smaller barrages installed in rural areas do not belong to anybody after the collective farming system collapsed. Some 5,000–10,000 are 'no man's barrages'. The Ministry of Natural Resources addressed this by transferring their ownership to the regions. It could not transfer them to private property, which was forbidden by law (Khamitov Interview 2005). A former Minister of Natural Resources of Russia commented upon this situation that there is nothing to divide here 'except responsibility and headache'. This does not mean that nobody was using those waters. But who was responsible for those waters, for their maintenance, repair work, and protection? To a great extent, the Soviet system fell because state property, which included almost all-national wealth, actually belonged to no one. Nobody felt responsible for it and almost everybody plundered it. Water and facilities without an owner was a serious problem.

9.4.3 Rights of Water Use

The new legislation expanded the range of water uses. The State monopoly was eliminated and the new legislation introduced rules constraining water use. Waters that remained state property were granted to individuals or legal entities for long- and short-term use, including rights of limited use (water servitude).

Individual water users had the right to use waters freely for their own needs and for entrepreneurial activity after obtaining a license. Legal entities were entitled to use waters only after obtaining a license. State and municipal waters were waters of common use. Waters that were the property of individuals or legal entities could be used for common use only if this limitation was registered and reimbursement was paid to the owner. Strands along the banks of waters of common use were subject to common use. The right to water use could be transferred from one person to another only on the basis of a management license. Forced termination of rights to use waters was possible if the water were not used, if waters were not used in accordance with their stated purpose, or if it were necessary to use the waters for state or municipal needs. Finally, rights of short- and long-term use of waters were established for periods of up to 3 years and 3–25 years, respectively.

9.4.4 Users Without Licenses

There were about 54,000 water users in Russia in 1998. Only 37,000 water users possessed permits for the use of waters. Thus, one third of water users accessed waters without a legally registered right. The situation for groundwater was especially grave: 12,300 licenses for the use of groundwater were issued, yet some 75% of groundwater users were operating without licenses (Khamitov Interview 2005). Water users evaded the licensing requirement as a premeditated strategy. This implies that many waters have no owners who are legally responsible for their condition and many water users without licenses were accessing waters.

9.4.5 Payments for Water Use

The reforms of the 1990s made payment for water use the paramount principle of water management (Water Code 1995: art. 121). Payments were due for: (1) water withdrawal; (2) hydropower generation; (3) timber-rafting; (4) mineral extraction; (5) communications; and (6) the discharge of wastewaters. Payments for water withdrawal were not imposed for: (1) fish breeding; (2) navigation; and (3) irrigation. Only industrial enterprises, however, were to pay for water withdrawal. Minimum and maximum payments rates were established within economic regions. Untimely or incomplete payment for the use of waters became a serious problem. Numerous forms of evasion were devised. The federal obligation to pay for water use was not introduced by the regions in due time. More than half of Russia's regions did not forward the federal portion of the payments to the federal budget. Twenty-two regions transferred less than 10%, another seven regions less than 5%, and one region less than 1%. Four regions made no payments to the federal budget for the use of waters at all. Evasion of payments was actively practiced by enterprises as well.

9.4.6 Balances and Limits in the New System

Quantitative instruments (water balances) should have ensured the distribution of water between water users in the Soviet period. Water balances survived in the Russian Federation, but they were applied in a radically modified manner. Water balances within the new system represent calculations whereby water needs are compared with water resources available within a river basin. Thus, water balances in the Russian Federation were instruments for the calculation of some parameters. Limits—the maximum allowable volumes of water resources withdrawal or the discharge of wastewaters of the required quality—were established on the basis of the water balances and information provided by applicants concerning their needs. The limits were fixed in the license. Water use limits couldn't be revised, but for enterprises they were not a rigidly fixed amount. The limits combined quantitative regulation with a flexible price. When the rate at which water was withdrawn and wastewaters were discharged exceeded established limits, the rates of payment for the payer were raised—at least in theory.

9.4.7 Drinking Water Supply

Federal programmes prioritized ensuring drinking water supply of appropriate quality and sufficient quantity. Implementation included: (1) the saving of drinking water; (2) improvement of drinking water quality; (3) the use of groundwater in the regions where surface waters were heavily polluted; (4) reconstruction of water supply systems in rural settlements; and (5) a regime of protected zones that were sources of drinking water supply. A special focus on the wider use of groundwater was encouraged. Construction and reconstruction of urban centralized systems of water supply should have increased the share of groundwater and should have reduced water consumption by 20–25%.

9.5 The Post-Soviet Period: The Water Code of 2006

A new Water Code was adopted by the Federal Assembly in 2006 and entered into effect in 2007 (Water Code 2006), replacing the Water Code of 1995. The Code of 2006 took a lot from the Code of 1995. Implementation of the new Code will be far from easy. The new water regulations not only aggravate the previous problems, but they also bring new ones. The power elite developed its own informal practices, which significantly hampered the implementation of regulatory norms while the elite gain strength to determine policy according to their interests. Therefore, the conflict between formal norms and informal practices may become more evident in the future. The Code stresses two significant points: the possibility of private ownership of waters; and the possibility of regulating water relations through civil law.

The major innovation of the new water Code is the redistribution of ownership of waters between the federation and the regions, which strengthened the position of the federal authorities significantly. Consequently, there is a revival of centralized water management in Russia, although under a different name. The following subsections examine these changes in more detail.

9.5.1 Ownership of Waters

Like the Code of 1995, the Water Code of 2006 addresses the private ownership of waters. As before, private ownership applies only to a limited number of waters of secondary importance—ponds or watered borrow pits that are treated as part of the lands in which they are located. Rivers, lakes, reservoirs, swamps, glaciers, canals, territorial waters, and groundwater, fall under federal or regional, but not municipal, ownership (Water Code 2006: art. 8). The Water Code of 2006 stipulates that natural persons have free access to water resources. State-owned (owned by federal or regional authorities) and municipal-owned water bodies are declared 'accessible to public' (Water Code 2006: art. 6).

9.5.2 Agreements Instead of Licenses

Agreements with large water users—legal entities—grant them the right to use state-owned and municipal-owned waters for the following purposes: (1) water withdrawal; (2) use of riparian areas; (3) electricity production; (4) provision of state security and defence; (5) wastewater discharge; (6) quays and ship repair facilities; (7) hydro-technical installations, irrigation systems, pipelines, submarine lines; and (8) minerals prospecting and mining and other purposes (Water Code 2006: art. 11). These grants require special agreements. The agreement is to stipulate: (1) the purposes and terms of water use; (2) the duration (not to exceed 20 years); (3) the amount and timing of payments for using the waters; (4) terms for cessation of the use; and (5) the responsibilities of the parties (Water Code 2006: arts. 13, 16). Such agreements replace the licenses that previously confirmed the right to water uses. Licenses had been subject to unilateral cancellation by the issuing authority. Water agreements can be terminated only according to civil law procedures (Water Code 2006: art. 17), generally requiring a court decision.

9.5.3 Water Use Fees

Water use fees are determined on the basis of the following principles (Water code 2006: arts. 18, 20): (1) encouraging rational use and protection of waters; (2) differentiating

fees by water basin; (3) regularity of payments; (4) a fine, five times the water use fee, for withdrawing water in excess of the quantities fixed in the agreement; and (5) a delay penalty for untimely payment for water use. Rather than a tax, it is an agreement-based payment. In the future, more money is expected to be collected from water use fees by increasing the agreement payments and by expanding the group of payers. Until 2007, navigation companies and agricultural companies did not pay for water use, and pollution fines were not applied to housing and utilities sector. Even now, fees for these companies are a much lower than for industrial water users.

9.5.4 Federal Competencies in Water Management

The Water Code of 2006 develops the competencies of the federal government and governmental bodies in detail, thereby determining the functioning of water management as a whole. These competencies are merely listed in the Code, without specific descriptions. The list of federal competencies in water management is extensive (Water Code 2006: art. 24): (1) owning, using, and managing federally owned waters; (2) drafting, approving, implementing, and amending schemes for the comprehensive use and protection of waters, including criteria for identifying waters that need federal control and supervision as well as regional control and supervision; (3) exercising control and supervision over waters, including monitoring; (4) establishing procedures for granting permission or concluding agreements for using water; (5) creating and operating basin councils; (6) deciding on hydrographic and hydro-economic zoning; (7) establishing fees for using federally owned waters and procedures for collecting such fees; (8) enforcing state control and supervision of the use and protection of waters, including establishing the maximum allowable impact on waters and water quality indicators; (9) redistributing surface waters and recharging groundwater, including defining rules for using and maintaining reservoirs; (10) reserving drinking water sources; (11) regulating activities affecting federally owned waters occurring on the territory of two or more federal regions; (12) defining the methodology for calculating damages to waters; (13) identifying persons responsible for federal control and supervision; and (14) other powers stipulated in the Code.

9.5.5 Informal Power Structures

In Russia, as in other societies, not only economy, but the society in general and the state live by unwritten laws, often leaving a huge gap between legislation and economic and social reality (Yavlinsky 2003: 30, 77, 79). ‘Informal relations’ may be defined as roles and norms of behaviour that are not established by legislation and that differ from it—unspoken, tacit rules of conduct that existed in the pre-Soviet,

Soviet, and post-Soviet periods. In the Soviet period, these relations determined the exchange of services between managers of different levels and spheres (the so-called administrative market). Norms of official law can only be applied to the extent that they do not contradict the unofficial rules of conduct.

Grigori Yavlinsky describes 'unreasonable expectations' that often accompany privatization, concluding that in Russia 'privatization … did not change anything—you can choose any formal legal status, but the real motivation and essence of economic agent's behaviour are determined not by the status, but by the nature of this agent and the real context in which he finds himself.… [L]iberalization of market economic activity was substituted by liberalization of privatized monopolies. Private property without competition is more harmful from the economic and political point of view, than state property' (Yavlinsky 2003: 19, 21). The symbiosis of three elements—informal relations, privatization and liberalization—opened the way for oligopolistic structures. In the reforms of the 1990s, 'market relations were not developed anew,' but 'were included into the already existing system of informal relations in the sphere of resource management and ownership … [A]ll subsequent attempts to create real institutions often proved to be useless—the new institutions voluntarily entered the established system of illegitimate relations, thus turning into a feeder for civil servants or into a useless decorative element' (Yavlinsky 2003: 22). Conflicts between parties are settled on the basis of belonging to certain interest groups. The power to solve the conflict in favour of one of the parties may be exercised, if the decisive actors, irrespective of their official status, have real power (Yavlinsky 2003: 22). '[T]he formal title of an owner … does not mean anything' without the actual control over the resources, 'which, by the way, can be established without procuring ownership of the assets … [I]n such circumstances, the … private property right cannot be unconditional' (Yavlinsky 2003: 30–31).

An analysis of the situation in water management in 2005–2006 shows that despite numerous laws, codes and ordinances, the legal norms remained vague, with legal loopholes and non-execution of the laws (Khamitov Interview 2006). The federal water agency received the Water Code of 2006 more favourably. Yet the new Water Code is no less vague than the previous one, and that was noticed by the Russian media. Some 70 State Duma (legislative) deputies sent a letter to the President of the Russian Federation in 2006 insisting on 'significant revision' of the new Water Code. The federal water agency is more concerned with further centralization of water resource management, rather than clarification of private or other rights.

Water management authorities at the federal and regional level have fought for many years over the collection of water use fees. In 2004, federal entities reported collecting nine billion roubles from water use fees. Only 20% of this amount was reinvested in the water economy. In 2006, a federal water tax was levied, producing 13 billion roubles, all of which were spent on the water economy. Federal entities, however, give a different opinion about the situation. They claim that federal authorities use water use fees as a primary financial tool, that they do not take into account regional interests in funding specific water-related projects, and that they use the collected money on purposes very distant from water economy.

Adoption of the Water Code of 2006 strengthened the position of the federal authorities, as all significant waters were transferred from ‘state property’ (which could be used by the federation or the regions, and which required a lot of effort and further negotiations to define their respective authority) to federal property. Federal authorities now have the right to establish their own control over this precious natural resource. Non-transparent water legislation plays into the hands of the federal bureaucracy. Their headaches are caused by the so-called ‘no man’s waters’. A solution seems to exist: The transfer of some responsibilities from federal level to the regions, including protection of waters, pollution prevention, the concluding of agreements with water users, flood mitigation, and disaster relief. The implementation of these competencies (and responsibilities) is very expensive. It would only be interesting to know how these extended responsibilities of regional authorities will be funded.

9.6 Conclusion

The new water legislation was developed and came into effect more than 10 years ago. Major problems emerged in implementation. Institutional structures changed dynamically over time. This chapter compares contemporary water management institutions and their historical predecessors (Soviet and pre-Soviet). These comparisons allow the drawing of the certain conclusions.

When analyzing Russian water legislation, it becomes clear that water management plays by the same rules (formal and informal) as the political and economic system generally. The formation of Russian water management structures was an integral element of the broader process of revolutionary transformation, and was a derivative result of the more comprehensive changes. The problems in Russian water management cannot be addressed merely within their own framework, and the ensuing problems cannot be solved simply through changes and corrections of water management alone given the serious deformation of economic and administrative structures in Russia. Today, some argue that Russia’s economic problems (including water management) result from the transfer of Western management practices. This theory does not give an adequate explanation of the problems. The models borrowed from the West were implanted into the informal structures inherited from the Soviet period; in the symbiosis of Western practices and informal relations, the latter dominated. Organizational structures and stereotypes stemming from Soviet times hampered further development and implementation of efficient management models.

In Russia, conflict between informal practices (local traditions and customs) and formal regulations (the legal regime) is one of the main characteristics of the present water management system. This conflict makes the institutional management structure unstable and contradictory, often turning formal water law regulations into decorative elements. Although the governing authorities have tried to fight the destructive influence of the informal practices on the formal law structure,

that proved difficult. Recently they have chosen to avoid a head-on collision. Informal practices developed over years, and the reasons for their development are found in the past, sometimes deep in the past. These patterns change very slowly, and in many cases they cannot keep up with external changes. It would be unrealistic to expect to overcome them easily.

Informal practice patterns are not universal for all groups of Russian society. The general public believes access to water (and other natural resources) should be open and free of charge. Russian peasants never recognized land ownership by the Russian nobility, believing the land belonged to the God. This gave rise to a heated and long-running conflict, shattering society and leading to the downfall of the Russian state in 1917. Water resources, however, did not cause such dramatic conflict as the land problem because even in the pre-Soviet period the authorities maintained that water resources had a status close to a public good and limited private ownership rights to water resources. This approach was justified by the role of water as a transportation route—all the more significant because of the poor state of Russian roads and the government's ambition to develop trade. At the same time, according to water law, the general public had free access to water resources. In the pre-Soviet times, water resources were not yet becoming scarce (unlike land). Water shortages were only from time to time and primarily in the steppe regions of Russia. The irrigation culture was not yet developed in Russia, except in the Crimea and in Transcaucasia. For the larger part of Russia, water was quite abundant, and people faced a contrary problem—the excess of water and the consequent need for drainage. Water was not yet considered an economic resource, and private ownership of access to water was useless. The potential conflict between the common belief that water belonged to God and the formal law did not arise and water disputes did not become as acute and as destructive as the conflict over land.

In the Soviet Union, water resources were declared the exclusive property of the state. Water resources, just like all other resources, became a subject of state monopoly that was maintained and protected by power. That monopoly contained a very significant exception: The general public had the right to use water for personal and household purposes, which in turn were subject to a significant limitation, namely that people had no right to use water for industrial or commercial purposes, as private entrepreneurship was strictly forbidden in the USSR. Another significant phenomenon is that, in line with Marx's theory, all natural resources (including waters) could be used free of charge, as human labour was not invested into the production of these resources. Soviet enterprises took advantage of this provision, and savagely wasted water resources, creating drinking water shortages throughout the country. Reverberations of the Soviet past can still be traced in the Water Code of 1995 that declared some of water users exempt from water use fees.

It may seem strange that open access to water resources and free-of-charge use of water continue to exist in the Russian Federation, even after the liberal post-Soviet reforms, and that they are proclaimed by the Water Code of 2006. But times change, and water is becoming scarcer as demand increases and environmental imperatives influence use. Conflicts between informal practices and the formal norms exist, and authorities have to consider these conflicts in their legislative

and executive practices. Conflicts inherited from the past are now aggravated by new ones, triggered by the new structure of Russian society and new managerial arrangements. The essence of the water management dilemma in Russia is that the demand for conserving water resources becomes more urgent and clashes with the lack of adequate tools to combat the plundering of water resources. The administrative levers of Soviet times are no longer applicable in the new political context, while the new (market) water policy tools are blocked by informal practices widely spread among the general public and the power elite.

If we look at three main periods in the development of the Russian state—pre-Soviet, Soviet, and post-Soviet—we can see that all three are characterized by strong dominance of the state as the main agent of water management. As old political and economic structures were replaced by new ones, the dominance of the state always held true. Not only the genetic basis of that dominance, but also its congenital problems, were passed on to descendants. These problems are deemed unsolvable by many politicians and decision-makers, just like chronic incurable diseases. Such attitudes stymie reform efforts. As Viktor Chernomirdin, a Russian prime minister in the 1990s, said, 'We intended for the best, but the result has been as usual'. It is a bitter evaluation of wasted time and effort, an expression of hopeless fatalism and belief in the powerful heritage of the past determining the fate of the people and the country. Perhaps a long-term analysis of these problems offers a new perspective that suggests an innovative approach to solving these problems.

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Chapter 10
India: Evolution of Water Law and Policy

Philippe Cullet and Joyeeta Gupta

Abstract This chapter examines the evolution of water law and policy in India from prehistoric to present times, briefly outlining pre-colonial developments and focusing on colonial and post-colonial issues and the complexity of regulating water in India. The resulting fragmentation of water law has not been overcome. Water law remains patchy today partly because it is a state subject while being also of concern at the union level and partly because elements of water law are in environment or health laws. Further, division of tasks between various social actors and levels is unclear. Water policy is pushed in a number of different directions, reflecting the specifics of the Indian situation, such as its complex administrative structure, overlapping and sometimes contradictory rights, vastly different endowments in water resources in different regions, and difficulties in allocating water in the most socially and economically appropriate manner.

Keywords Hindu law • right to water • water law • water history • water governance

10.1 Introduction: Historic Evolution

India is a subcontinent surrounded by the Arabian Sea on the West, the Indian Ocean in the South, the Bay of Bengal in the East and the Himalayas in the North. It covers about 3 million square kilometres, and includes 28 States and 7 Union Territories. It is home to about 1/6th of the world's population, more than 1,000,000,000 people.

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India is criss-crossed by 12 major river systems. About 85% of the available water is used for agricultural purposes, 8% for domestic purposes and 5% for industry (FAO Aquastats 2003). Its long history can be traced back to the Indus Valley Civilization that emerged on the banks of the river Indus. Over the last 5,000 years, society has evolved under multiple kingdoms. It was often conquered by invaders from other countries, each bringing its own system of governance. Part of this story is recorded in historical accounts and records of visitors to India and part is unrecorded, giving a patchy, incomplete picture of the evolution of water management. Nevertheless, this chapter explores the available information to provide an overview of the key elements of the changes in Indian water law and policy over the centuries, focusing, however, on more recent developments.

This chapter first provides a brief history of water law in pre-colonial and colonial India, before moving on to discuss post-colonial water management in the country. It closes with the present decade to highlight current challenges.

10.2 The Pre-colonial History of Water Law

The pre-colonial history of water law in India (2500 BCE until sixteenth to seventeenth century CE) can be divided into an analysis of ancient India (2500 BCE until about the tenth century CE), and medieval India with the arrival of the Muslims through the Mughals after the sixteenth century. Water law in ancient India evolved slowly from custom, religion and written codes. This section elaborates briefly on the historical context and then focuses on the evolution of water law.

10.2.1 Historical Context

The Indus Valley Civilization flourished around 2500 BCE. Water was vital for the civilization and was used primarily for human personal use and irrigation. The most important structure in the city of Mohenjodaro was the Great Bath, which had water channels leading to and from it (Majumdar et al. 1978). Its remains can still be seen today. The Indus Valley civilization gave way to Indo-European invaders who were initially less settled in their lifestyles.

In societies of food gatherers, humans protected their environment because that was their resource base. Trees, groves, and water bodies were seen as sacred. As society evolved, specific trees and ponds were seen less as supernatural and the focus shifted to the earth, fire, wind, water, and sky. Varuna was the God of Waters and Indra was the God of thunder and rain. This often accompanied agricultural development that led to deforestation and changes in land use and forests then lost their supernatural powers. Gadgil and Guha (1992: 79) explain how forests and forest creatures were sacrificed to the sun god in the Mahabharata and see this as a way for the Pandavas to convert forestland into agricultural land. Drinking water was obtained from rivers, springs, and artificial wells (Majumdar et al. 1978: 30).

Agriculture was the principal source of employment and fields often required irrigation. Navigation was also a significant use of rivers (Majumdar et al. 1978: 34). Between 500 BCE and 300 CE, the large food surpluses implied no real shortage of water and supported trade development along water channels.

At this time, Jainism and Buddhism were born as counter religious forces to promote conservation of natural resources. Mahavir Jain and Gautama Buddha, who lived in about the sixth Century BCE, promoted right conduct and belief, and respect for fellow creatures. With the spread of agricultural settlements along the banks of rivers and on fertile lands, labour was needed to undertake specific tasks. Food gatherers were incorporated into the settled system of agriculture, through conquest or otherwise, as the lowest castes. Some argue that these lower castes subsequently began to follow Buddhist beliefs with its ideas of non-violence. After the devastating war of Kalinga, the victorious Emperor Ashoka himself embraced Buddhism and preached non-violence and Ahimsa to his people. Ashoka also called on his officers to build reservoirs and plant trees (Majumdar et al. 1978: 100).

By 400 CE, there was a decline in Buddhism and Jainism and this was accompanied by a decline in agricultural production—possibly because of water shortages, decline in soil fertility, and/or the growth of human population. During the reign of the Gupta's and thereafter until about the 1000 CE, the lack of resources led once more to worshipping individual animals and trees and a focus on conservation. This was a period of low trade and urbanization. From around the ninth century, the development of new tank technologies and improved dams and canals in South India paved the way for the development of large-scale peasant agriculture that displaced pastoralism (Mosse 2003: 53).

10.2.2 Hindu Water Law

Hinduism is considered a living tradition that expresses universal truth. Each creature is made of parts and is part of the community and the cosmos. Harmony is achieved when human actions or *karma* match the nature of the human. Human actions are governed by *dharma* (law and order) that is concretized in the sacred books of the Hindus—the *Vedas*, which include the *Shrutis* and the *Smritis*. The Laws of Manu (*c*.200–100 BCE), within this tradition, provide indications of the water law of the time. Water was considered indivisible. Those who could were obligated to develop water works for the benefit of others (ch. IV, §§226, 229). Kings should protect public waters and collect fees for crossing waters (ch. VIII, §§61, 69; ch. IX, §§264–266, 281). Diversion or obstruction of waters was discouraged (ch. III, §151) and the laws imposed a system of social reprimands and punishments for those who polluted the water or who stole or diverted water (ch. IV, §§46, 48, 56; ch. XI, §174; ch. VIII, §309; ch. IX, §281). Destruction of embankments was illegal. The law encouraged the use of water bodies as boundaries between villages to ensure that as many villages as possible had access to water (ch. VII, §§4–7). Water bodies of enemies, however, could be destroyed in times of war (ch. IX, §28). A water controller was in charge of water administration.

A manuscript—*Arthashastra* ('The Science of Politics')—also provides a detailed account of governance in the Kautilian period. It reflects on the legal and political system from around 350 BCE to about 150 CE. The *Arthashastra* discusses the use of water for the development of water works, irrigation, and transport, specifying that all water belonged to the king and that users were to pay a water tax to withdraw water from irrigation systems installed by the king (Kautilya *c*.300 BCE–300 CE: 73–74). The system of taxes was very elaborate. When new tanks and embankments or renovation works were undertaken or when water works were cleaned and made ready for use, there was a 5, 4, or 3-year exemption from taxes. There were limited provisions for private ownership and these included immovable properties such as reservoirs, embankments and tanks, with the owners having the right to sell or mortgage these. Where such tanks were not in use for a period of 5 years, ownership rights lapsed. All those who leased, hired, or shared such a body had the responsibility to maintain them. Private owners were allowed to give waters to other parties through irrigation works in exchange for produce. The taxes that were owed to the King were specified in great detail (Kautilya *c*.300 BCE: 231–232) and these were collected by the Chief Superintendent of Crown Lands (Kautilya *c*.300 BCE: 315).

The *Arthashashtra* stated that in irrigating one's own field, no harm is to be caused to others. It prohibited the release of water from dams without a legitimate reason, the obstruction of the legitimate use of water by others, the obstruction or diversion of the watercourse, and the building of water works on the land belonging to someone else. Where damage was caused to another party as a result of overflowing waters, compensation was owed to the other party. The *Arthashashtra* provides a list of damage types and the corresponding compensation or penalty due. These included the death penalty (death by drowning) (Kautilya *c*.300 BCE: 232–233). Water routes could be used for the purposes of transport and trade (Kautilya *c*.300 BCE: 623) and the principle of good neighbourliness was a civic duty.

The *Arthashastra* explains that there were four sources of law: The *Dharma* based on truth; evidence provided by witnesses; customs and traditions accepted by the people; and royal edicts adopted by the king. The *Arthashastra* submits that where a king rules over a territory, he should ensure *dharma*, and *dharma* only exists when there is order. Hence, if customs already exist in specific places, the king should allow the continuance of the custom. Once the king makes a rule, however, he should ensure enforcement. The *Arthashastra* elaborates in great detail on foreign policy, but does not say much explicitly about water. It leaves room, however, for treaties to develop joint water works.

10.2.3 Islamic Water Law in India

From the tenth century onwards, Islamic rulers governed Northern India. Subsequently, the Mughals came to power in the sixteenth century and stayed in power until European colonialists took power. This implies that Islamic rules were probably introduced in this period. Islamic law principles (see Naff, this book) include that water is a gift of God, that no individual or ruler can own water,

and that everyone should have access to water (Naff & Dellapenna 2002: 477). These principles include a right of thirst, which gives humans and animals the right to quench their thirst from any available water point (Faruqui 2001).

The influence of Muslim rule in India on water regulation has not been conclusively ascertained (Siddiqui 1992: 295). Islamic rulers refrained from significant intervention in existing arrangements, generally applying Islamic law to the Islamic population while allowing non-believers to follow their own systems. Possibly, the relatively high availability of water in India precluded conflicts with Islamic norms (Siddiqui 1992: 289). This may also explain the relative lack of attention towards water regulation during this era (Siddiqui 1992: 295).

10.2.4 Colonial Policies and Laws on Water

From the sixteenth century onwards, European colonialism began in India. It accelerated during the industrial revolution in England. Colonization brought three major influences—a transformation from a resource gathering and food production economy into a commodity-oriented economy; a change in long-standing social relations and customs as local social relations became less important and social cohesion declined; and the development of the market and the importance given to wealth (Gadgil & Guha 1992: 116). Commercial production became more important than subsistence, exploitation more important than conservation, and the individual more important than the community. While colonization in India was less aggressive than in Africa, the British deforested large tracts in order to access coal and timber and to promote agriculture. The state gradually took ownership of forests and community irrigation and usufructuary schemes were dismantled. Water logging and salinity problems increased and small-scale irrigation schemes broke down leading to impoverishment of the small farmers.

The British introduced the concept of government control over surface waters. In the early stages, legal and administrative changes were motivated by the need for colonial expansion and to amass wealth, the East India Company focused on advancing trade and traffic, and law developed through practice and the judicial process (Siddiqui 1992). Until 1857 the British did not interfere with local rules and customs unless it interfered with their policies. The Presidency areas were completely subject to British rule, mofussil areas experienced a plural system of law, and further away local systems of law existed. A few laws were enacted such as the Bengal Regulation VI of 1819 to regulate ferries and the Charter Act of 1833 was an initial attempt to codify the laws in India. Following the 1857 revolution, the British began to consolidate power focusing both on famine relief and the need to maintain the resource base of trade (Majumdar et al. 1978). The British began to invest in and regulate canals and irrigation facilities.

British colonial water law had two main strands. First, control over water and rights to water were regulated through the progressive introduction of common law principles, emphasizing the rights of landowners to access water. For surface

waters, riparian rights allow a landowner the right to take a reasonable portion of the flow of a watercourse (Dellapenna 2001). For groundwater, landowners had a virtually unlimited right to access water under their holdings. Common law principles, enshrined in the Indian Easements Act (1882), evolved over time but have substantially survived until the present day (Getzler 2004). Second, a series of regulatory statutes were enacted, including laws to protect and maintain embankments, to acquire land for embankments, and to entrust the Controller for implementing such laws (e.g., Embankment Regulation 1829; Bengal Embankment Act 1855; Siddiqui 1992). Other laws regulated canals for navigation purposes and levying taxes on the users, river conservation, and rules on ferries and fisheries (e.g., Northern India Ferries Act 1878; Indian Fisheries Act 1897). Regulations recognizing local practices and rules in villages were also enacted.

One of the most important enactments was the Northern India Canal and Drainage Act (1873), which regulated irrigation, navigation and drainage. While this Act did not directly assert the state's ownership over surface waters, it recognized the right of the Government to 'use and control for public purposes the water of all rivers and streams flowing in natural channels, and of all lakes' (Preamble). This led to the progressive strengthening of state control over surface water and the concomitant weakening of people's customary rights. This tendency was progressively strengthened. The Madhya Pradesh Irrigation Act (1931: §26) provided that: 'All rights in the water of any river, natural stream or natural drainage channel, natural lake or other natural collection of water shall vest in the Government'.

Colonial legislation also introduced the division of responsibilities between the centre and the regions/states with regard to water. The Government of India Act (1935) empowered the provinces to take decisions on water supply, irrigation, canals, drainage and embankments, water storage and hydropower. Conflicts between provinces and/or princely states were subjected to the jurisdiction of the Governor General who could appoint a commission to investigate the sufficiently important conflicts (§§130–134).

10.3 Post-colonial Water Law and Policies

Water law in the post-colonial period is shaped by the legacy of colonial times, constitutional and federal developments, specific rules on surface and groundwater irrigation, human rights, social and environmental issues, issue about dams, and questions of water cooperation with neighbouring countries.

10.3.1 The Legacy of Colonial Times

Since independence in 1947, most states have regulated territorial water bodies, embankments, drinking water supply, irrigation, floods, water conservation, water pollution, rehabilitation of the displaced, fisheries, and ferries (Siddiqui 1992).

While significant novel aspects were introduced, the evolution from colonial water law was slow. Many colonial acts have not yet been superseded and the basic structure of common law rights linking water rights and land rights has not yet been comprehensively reworked (Singh 1991). Since the early 1970s, signs of more fundamental changes have emerged, possibly attributable to the fast decreasing per capita availability of water, increasing pollution of existing water supplies, the fast increasing use of water for irrigation, and increasing competition among water users for a larger share of finite supplies. Another colonial trend that has continued is the increasing displacement of customary and local rules and practices by formal state or central laws. While formal law and policymaking does not directly relate to customary practices, new water rules and policies have the direct or indirect effect of displacing or replacing existing local institutional arrangements and rules.

10.3.2 The Constitution and Union Legislation

The Constitution provides for the continuation of all laws in force at the time of the adoption of the Constitution (1947: art. 372). It generally follows the scheme introduced in the Government of India Act (1935), where water is a state subject. States have the exclusive power to regulate water supplies, irrigation and canals, drainage and embankments, water storage, water power and fisheries (Constitution 1947: Schedule 7, List 2, Entries 17, 21). There are restrictions regarding the use of interstate rivers (Schedule 7, List 1, Entry 56). The Union is entitled to legislate on shipping and navigation on national waterways, on tidal and territorial waters (Schedule 7, List 1, Entries 24, 25, 57); and on the adjudication of inter-state water disputes (art. 262). The latter was regulated in the Inter-State Water Disputes Act (1956). It creates specific tribunals for addressing interstate water disputes. This Act has been used in landmark disputes concerning the Cauvery, Krishna-Godavari, and Narmada rivers. The Krishna-Godavari dispute began in 1951; a key issue was whether initial agreements about diversions from the river were justified given legal and political changes following independence (D'Souza 2006: 137). The Cauvery dispute between Karnataka and Tamil Nadu is more than a century old and relates to water sharing. The Narmada dispute focused on the use of available water by riparian states and provided the framework for the construction of the Sardar Sarovar dam, situated in Gujarat, but whose submergence zone is mostly in Madhya Pradesh and Maharashtra (Narmada Water Disputes Tribunal 1979).

The Parliament also enacted the River Boards Act (1956) to allow the Central Government to establish river boards to advise state governments on the regulation or development of an interstate river or river valley. River boards can advise on conservation, control and optimum utilization of water resources, the promotion and operation of schemes for irrigation, water supply or drainage, or the promotion and operation of schemes for flood control (§13). This Act, however, has not been used in practice.

10.3.3 Surface and Groundwater Irrigation

Since independence, states have enacted irrigation laws that generally follow the pattern of colonial legislation. Surface water irrigation legislation until the 1990s displays little novelty in terms of basic legal principles. The Rajasthan Irrigation and Drainage Act (1954: §5) maintains the right of the state to determine whether surface water is to be used for irrigation or drainage schemes based on whether the scheme serves 'public purposes'. In Madhya Pradesh, not only has the 1931 Irrigation Act been maintained but also the 1949 Regulation of Waters Act vested 'all rights in the water of any natural source of supply' in the Government (§3), as does the Bihar Irrigation Act (1997: §3a).

Since the Central Government does not have jurisdiction over groundwater, the measures that it can take are limited. The rapid depletion of groundwater as a result of extraction for irrigation and other uses over the past 50 years has led to policy development in this area. The central government formulated the Model Bill to Regulate and Control the Development and Management of Ground Water (2005). The Environment Protection Act (1986: §3(3)) established a Central Ground Water Authority to regulate and control development and management of groundwater resources. State governments, however, have been slow to respond, although recently a number of states have adopted groundwater acts. Although different, these state acts follow the scheme of the model bill. The main features are: (1) establishment of a groundwater authority under the direct control of the government; (2) the authority is given the right to notify areas where it is deemed necessary to regulate the use of groundwater; (3) the final decision is taken by the respective state government (Model Bill 2005: §5); (4) in any notified area, every user of groundwater must apply for a permit from the authority unless the user only proposes to use a hand pump or a well from which water is withdrawn manually (§6); (5) decisions of the authority in granting or denying permits are based on factors that include such technical questions as the availability of groundwater, the quantity and quality of water to be drawn, and the spacing between groundwater structures; (6) the authority also takes into account the purpose for which groundwater is to be drawn, without prioritizing domestic uses over other uses (§6(5)(a); the Model Bill only provides that the purpose is to be taken into account, while §6(5)(h)—the only subsection referring to drinking water—only considers it as an indirect factor); (7) all wells, even in non-notified areas must be registered (§8). The model bill provides for the grandfathering of existing uses by only requiring the registration of such uses (§7). Where water scarcity already exists, an act modelled after these provisions does not provide an effective basis for controlling existing overuse of groundwater and provides only a basis for ensuring that future use is more sustainable.

Overall, the model bill constitutes an instrument seeking to broaden state control over the use of groundwater by imposing the registration of all groundwater infrastructures and providing a basis for introducing permits for groundwater extraction in regions where groundwater is over-exploited. Besides providing a framework for asserting government control over the groundwater use, the model bill also

expresses limited concerns for the sustainability of use. It does not, however, propose a clear break from rules of access linked to land ownership.

10.3.4 Human Rights and the Social and Environmental Aspects of Water

While the Constitution does not recognize a fundamental right to water, court decisions deem such a right to be implied in Article 21 (right to life) (Muralidhar 2006). The right to water is arguably implied in the recognition of the right to a clean environment. In *Subhash Kumar v. State of Bihar* (1991, ¶7), the Supreme Court recognized that the right to life 'includes the right of enjoyment of pollution free water and air for full enjoyment of life'. In the Sardar Sarovar case, the Supreme Court directly derived the right to water from Article 21, stating that '[w]ater is the basic need for the survival of the human beings and is part of right of life and human rights as enshrined in Article 21 of the Constitution of India (*Narmada Bachao Andolan v. Union of India* 2000, ¶274).

While judicial recognition of a fundamental right to water is unequivocal, its implementation through policies and acts is not as advanced. Recent initiatives include the Rajiv Gandhi National Drinking Water Mission that seeks to ensure that all villages in the country get drinking water supply. The goal has not yet been achieved and significant gaps have been identified in policy implementation (Planning Commission 2006). For urban water supply, various cities have adopted regulations or laws to regulate drinking water supply. Regarding water pollution, one of the most important developments was the adoption of the Water (Prevention and Control of Pollution) Act (1974). This act seeks to prevent and control water pollution and maintain and restore the wholesomeness of water. It creates water boards to set standards and regulations for the prevention and control of pollution. The Supreme Court affirmed, in *M.C. Mehta v. Kamal Nath* (1997: ¶34), that water is a public trust, with the state as 'the trustee of all natural resources which are by nature meant for public use and enjoyment'.

10.3.5 Dams

In the past 6 decades, hundreds of big dams have been built in India to promote development. Many dams have been controversial, starting from the first major post-independence irrigation project, the Bhakra dam, which was hailed as a milestone for a long time and has come under increasing criticism in recent years (Dharmadhikary 2005). The rationale for big dams remains to increase the irrigation potential to foster food security, to generate power, and, in many cases, to provide drinking water. The rationale for big dams has shifted over time in keeping with the increasing criticism concerning dam-induced human displacement

and environmental degradation. Today, after the crisis in big dam building caused by the Sardar Sarovar Project controversy (Cullet 2007), dams are again being proposed as an alternative to carbon-based sources of energy in order to mitigate climate change.

The legal regime on dams includes the Guidelines for Environmental Impact Assessment of River Valley Projects (1985), which provide a general framework for assessing the impacts of planned projects, and the more comprehensive Notification on Environmental Impact Assessment of Development Projects (1994), which provides a framework for assessing the environmental impacts of planned big hydropower and irrigation projects. The notification has been amended repeatedly until a new Notification on Environmental Impact Assessment was adopted in 2006, further weakening the process of environmental impact assessment. In particular, the validity of a clearance was increased from 5 to 10 years, with the possibility to further increase this validity by another 5 years (§9).

Regarding human displacement, the main act that applies is still the Land Acquisition Act (1894), enacted with the interests of the colonial government rather than the interests of the displaced in mind. It gives the government significant control over the process of eviction and the displaced very few rights. There is no obligation to provide land-for-land compensation. After nearly 2 decades of debates, a Draft National Policy on Resettlement and Rehabilitation for Project Affected Families (2004) was proposed, followed by the more progressive Draft National Development, Displacement and Rehabilitation Policy (2005) that provides, for instance, for land-for-land compensation. This was superseded by the National Rehabilitation and Resettlement Policy of 2007 that backtracks on the proposals. There is only one case—the Sardar Sarovar dam—where the Tribunal set up under the Inter-State Water Disputes Act decided that the displaced should be given land-for-land compensation (Narmada Water Disputes Tribunal 1979). This proved controversial and Madhya Pradesh, for instance, proposes cash compensation instead of land-for-land compensation (Cullet 2007: 303).

10.3.6 Water Cooperation with Neighbours

India has entered into a number of treaties with its neighbours. Some of these agreements are to be in place for periods that range from a short time (30 years for the Ganges), to a long time (199 years in the case of the Kosi), to an indefinite time period for the Indus. Each agreement reflects the issues most important at the time of the negotiation. The earliest Indus agreements focused on sharing, while the more recent agreements focus on irrigation, power, and flood control.

The Indus Waters Treaty signed in 1960 by Pakistan and India led to the establishment of the permanent Indus Committee and the division of the river and its tributaries between India and Pakistan (Kalpakkian 2004; Salman & Uprety 2002). Cooperation has been relatively stable in water sharing, despite the stress in other issue areas.

India shares four key rivers with Nepal—the Kosi, Gandaki, Karnali, and Mahakali (Kalpakkian 2004; Salman & Uprety 2002). The agreements on the Kosi allegedly benefit India and there is tension between the two countries regarding water sharing. The 1996 Mahakali Agreement was a more balanced agreement and included a flood forecasting and warning system.

With Bangladesh, the Joint Rivers Commission was established in 1972 (Subedi 2005). The two countries share about 50 rivers but the bulk of the stress has focused on the Farakka Barage. In a 1996 treaty, both countries attempted to negotiate a settlement with respect to this river. But since the agreement does not cover the other riparians, its long-term effectiveness is unclear (Salman & Uprety 2002).

A key issue is that although China is the upper riparian on several rivers flowing into India, there are no watercourse agreements with China. There are reports that the waters in Tibet could be diverted to meet the needs of northern China. If that does occur, this would lead to considerable stress between the two countries. In 2002, a memorandum of understanding was signed between China and India for sharing relevant information and may form the basis for future cooperation.

10.4 Recent and Ongoing Water Law and Policy Reforms

Over the past 2 decades, renewed interest in water law and policy can be ascribed to increasing water scarcity, increasing water pollution, competition among users for a finite resource, progressively changing economic policies at the national and international levels, and new water policy priorities at the international level. The following subsections address the current situation and the likely developments regarding water policies and the controversial river linking project.

10.4.1 National and State Water Policies

By the 1980s, it became evident that while water was largely a state subject, the lack of a national policy on water was a major impediment to the development of coherent water policies. This led to the development of the National Water Policy (1987) that was reformulated in 2002. The two documents are similar, focusing on developing a data bank, estimating the available water, prioritizing water (with access to drinking water accorded priority), developing groundwater rules, meeting drinking water needs, developing irrigation facilities, encouraging the participation of stakeholders in water management, monitoring water quality, promoting conservation consciousness, developing a flood control and management system, using cost effective measures to minimize erosion, maintenance and modernization of water works, ensuring the safety of structures built on water bodies, developing relevant science and technology, and training of personnel. The key differences between the documents are that the 2002 policy focuses on the development of an improved institutional framework with a focus on enhancing

the performance of the institutions, promoting of rehabilitation schemes for the displaced, enhancing participation by private parties in water management, developing an effective monitoring system, and ensuring that states share the waters of a joint river.

The national policy has been supplemented by state water policies. The national and state policies are based on similar principles: water as a natural or economic resource that can be harnessed to foster the productive capacity of the economy, from irrigation water for agricultural production to water for hydropower; and priority of use that should be allocated in the following order: drinking water, irrigation, hydropower, ecology, agro-industries and non-agricultural industries, navigation and other uses (National Water Policy 2002: §5; Rajasthan State Water Policy 1999: §8). Domestic uses of water have overriding priority in water allocation. Nevertheless, some policies also provide that this priority list can be changed if circumstances so require, thus ensuring that there is little substance in the prioritization (Maharashtra State Water Policy 2003: §4; Rajasthan State Water Policy 1999: §8).

The policies generally provide that beneficiaries and other stakeholders should be involved from the project planning stage (National Water Policy 2002: §6(8)). The participatory provisions link participation with decentralization, focusing on the need to devolve the control of irrigation systems to users. This is premised on the perceived inability of the state to deliver appropriate benefits to farmers. The basic idea is to transfer part or full control of irrigation systems to users by both allowing and forcing them to maintain and finance irrigation systems and share water among themselves (Uttar Pradesh Water Policy (1999): §17(1)).

The policies generally promote the use of 'incentives' to ensure that water is used 'more efficiently and productively' (Maharashtra State Water Policy 2003: §1(3)). This implies increased private sector involvement in water control and use from planning to development to administration of water resources projects (National Water Policy 2002: §13). Urban water supply is singled out for private sector participation (Rajasthan State Water Policy 1999: §9).

The water policies propose the introduction of water rights. Water rights are not new *per se* and there is a vast corpus of relevant law. The policies restate that the state is the 'sole owner of the water resources' even while they propose to create water rights in favour of users (Uttar Pradesh Water Policy 1999: §17(1)(d)). These rights are said to be the necessary premise for participation in the 'management' of water resources, for the setting up of water user associations, and for the introduction of trading in entitlements. Trading is specifically proposed in certain policies (Maharashtra State Water Policy 2003: §4(2)).

The policies also introduce wide-ranging legal and institutional reforms, of which three are significant: the introduction of a legal framework for the formation of water user associations to decentralize water governance; the introduction of laws providing for the establishment of a water resources authority whose primary characteristic is to be largely independent from existing irrigation and other water resource departments; and the regulation of groundwater (Karnataka State Water Policy 2002: §7).

10.4.2 Water Sector Reforms in India

National and international factors have influenced broad-ranging 'water sector reforms' carried out partly through projects seeking, for instance, to introduce changes in specific places, such as reforms in water services in specific cities, or in specific activities such as the introduction of participatory management in irrigation. While these reforms are linked to the water policies highlighted above, they were at first often not backed by legislative changes. Over time, there has been an increasing emphasis of regulatory changes to ensure the diffusion of water reforms, their predictability and stability.

While water law reforms are largely state specific, they are similar because they are based on similar national or international policy interventions. First, states like Andhra Pradesh, Rajasthan and Maharashtra foster the participation of farmers in irrigation schemes along the principles of 'participatory irrigation management' (Andhra Pradesh Farmers Management of Irrigation Systems Act 1997; Maharashtra Management of Irrigation Systems by Farmers Act 2005; Rajasthan Farmers' Participation in Management of Irrigation Systems Act 2000). Second, several states, including Andhra Pradesh and Maharashtra have adopted sweeping legislation seeking to restructure the water institutional framework (Andhra Pradesh Water Resources Development Corporation Act 1997; Maharashtra Water Resources Regulatory Authority Act 2005). The rationale for setting up a new water authority is to remove some power from existing water bureaucracies and to ensure that reforms are successfully implemented. Third, several states have now adopted groundwater legislation (see Section 10.3.3).

10.4.3 The River-Linking Project

Recent water sector reforms and accompanying water law reforms will radically change the law and policy framework governing the water sector in India. The mammoth project seeking to link rivers in different basins throughout the country constitutes the single most important development in this area. The rationale for this project is that while some parts of the country are facing water shortages, other parts have excess water (Briscoe & Malik 2006). Inter-basin transfer will seek to export from basins with excess water to basins with water shortage, and will help capture and store rainwater. This project will promote big dam building and coincides with the World Bank view that India still has relatively little capacity to store water and that major investments are required in small and big projects, including large dams.

It was first proposed in August 1980, when the Ministry of Water Resources prepared a National Perspective for Water Development. Two years later, the National Water Development Agency was established to prepare follow-up studies. In 2002, the Supreme Court ordered in a public interest litigation case that the government should complete linking the rivers in India by 2014 (*Writ Petition* (*Civil*) no: 512/2002). This led to the appointment of a Task Force. Based on approvals

from the Technical Advisory Committee and the Planning Commission, as well as on an environmental impact assessment under the Environment Protection Act of 1986, it was decided that such river linking projects could commence. The first Memorandum of Agreement between Uttar Pradesh and Madhya Pradesh was signed in 2005 to link the Ken and Betwa rivers. Proponents of the scheme believe that the river linking project will ultimately have some 30 links between 37 rivers, will include 3,000 storage facilities, will cost up to US$200 billion and could perhaps provide irrigation to 35 million hectares (Bandyopadhyay & Perveen 2002).

Arguments in favour of river inter-linking are better distribution of water, flood protection, and promotion of economic activities in water poor areas (Iyer 2004). The arguments against such interlinkage are that there is never surplus water in a river, it is hugely expensive and not cost effective, will lead to suboptimal use of water resources, and that changed structures of channels may lead to increasing the salt gradient, water loss, seepage and saline pollution of soil in the transporting section (Bandyopadhyay & Perveen 2004; Gupta & van der Zaag 2008).

Clear criteria should be met to justify such a transfer (Heyns 2002). While Madhya Pradesh, Haryana, Rajasthan and Tamil Nadu support the scheme, Kerala, Bihar, West Bengal, Assam, Punjab, Chandigarh and Goa oppose it. Some states are conditionally in support. An additional problem is that these rivers are not all national rivers and newspaper articles in Bangladesh have regularly critiqued this unilateral approach. Within India, activists argue that there are major social and ecological shortcomings to the scheme (Patkar 2004). Apart from the specific problems associated with inter-basin transfers, the proposed inter-linking which suggests the building of a number of big dams and canals is also subject to the same criticisms that apply to big dam projects generally (Iyer 2004: 19).

10.5 Conclusions

This historical overview of the evolution of Indian water law reveals how intricately water law is linked not only with the social, religious, and economic developments, but also with the rise and fall of rulers. Yet there are certain common elements. The common elements of water law—property law, the right to water, restrictions on nuisance, penalties, and monitoring systems—can be found in ancient Hindu water law and all subsequent bodies of law. Within these key concepts there may be differences regarding who has ownership, and how rights are acquired, but the basic subject matter of water law has remained relatively constant.

With conquest, the aim of the rulers was to consolidate control, but not necessarily intervene in the lives in the villages and small cities. Thus, the closer one was to the capital, the more it was likely that rights to water and water ownership rules changed to suit the rulers, but there was a coexistence of systems of water rules from the early Hindu times until 1857. It is only as water became vital to trade, transport, agriculture, and industry, that a comprehensive system to control water works was established. And yet, given the vastness of India, the British may have changed the

laws on the books but were not able to change rules and practices at local levels. Thus pluralistic systems of water laws have existed in India over the last 4,000 years. However, changes over the past 150 years have increasingly affected or displaced local rules and institutional arrangements. A great number still remain in place, but every new piece of legislation imposes new changes at the local level.

Since 1857, there has been a steady increase in government intervention in this area. The division of responsibilities between the states and the union initiated in the colonial era gives states primary control over water. Nevertheless, unifying efforts have taken place within national water and environmental policy. In the past decades a new trend promotes the use of government legislation to strengthen control over water use while strengthening the position of private actors. Ongoing water law reforms promise to bring about a completely revamped water law in coming years. These dramatic policy and law reforms together with other initiatives such as the interlinking of rivers seek to provide an answer to the problems identified in the water sector.

It is unlikely that either ongoing water law reforms or the interlinking of rivers will provide comprehensive solutions to existing problems. Indeed, water law reforms are largely limited to changes to the management of the water system and fail, for instance, to effectively address social and human rights. Regarding interlinking and the new reservoirs that it seeks to create, the negative consequences of large dams have already been shown over the past decades. Neither reform strategy is likely to provide an effective answer to existing problems. Further law and policy reforms will thus be required in the future.

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Uttar Pradesh Water Policy (1999).
Water (Prevention and Control of Pollution) Act (1974).

Chapter 11
Australia: The Problem of Sustainability in Water

Jennifer McKay and Simon Marsden

Abstract This chapter identifies five paradigms in Australian water quantity and quality regulation from the period before white settlement to the present day. After white settlement, these paradigms progressed from the common law, to State statutes, and finally to a more centralized approach. The chapters describe the social drivers in each transition, which in the last three phases were (and are) acute, involving both resistance to legal change and growing public emphasis on environmentally sustainable development. This chapter uses cases to illustrate the issues and also identifies major legal events leading to the latest paradigm and the difficulties of achieving environmentally sustainable development.

Keywords Common law · water law · water politics · sustainable development · common law rules

11.1 Introduction

Water management involves complex eco-social processes, implemented at least in part by laws, imposed over complex and variable ecological systems. Although it is easier to regulate one item than to regulate a commons composed of entire ecosystems, the water commons needs to be managed to achieve ecologically sustainable development. The past 2 centuries has seen increasingly unsustainable exploitation of water on the planet's driest continent, resulting in institutional and legal reforms to establish ecologically sustainable development as the overriding goal in 1994. Lack of coordination between states initiatives and policy coherence

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between and within States remain key issues (Editorial 2006; McKay 2005). These concerns led to the Water Act of 2007, by which the Commonwealth aims for a basin plan for the whole Murray Darling Basin area (see map) built on State plans that the new Murray Darling Basin Authority will endorse or adopt. This process will increase coordination between the States and also introduce full consideration of the interrelations of upstream/downstream users.

This chapter identifies key water law cases and relevant events related to water quantity and quality, analyzing particular water laws and issues for surface- and groundwater for each paradigm. Australian water law is an historical patchwork of common law and State-based statutory schemes, with a more recent layer of federal intervention driving change in water laws. This has resulted in five paradigms of water laws: (1) 1788–1901: State colonial laws (2) 1901–1983: fiscal federalism (3) 1983–1994: multi-state cooperation (4) 1994–2007: environmentally sustainable development requirements (5) 2007 to present: justiciable protocols. The remainder of this chapter, after a brief consideration of aboriginal practices, explores these five paradigms

11.2 Aboriginal Practices

When white settlers first arrived in Australia, the continent was already peopled by the aborigines. The aborigines had a deep economic and spiritual connection to water, as suggested by their languages, surviving cultural practices, and tribal boundaries (Australian Government 2007; Rose 2006). Aboriginal water practices were much less intensive, and less polluting, than were the practices of the white settlers. The white viewed the land as *terra nullius*, and aboriginal society was simply swept aside and the water practices were largely ignored (McKay 2002). Until the decision in *Mabo v. Queensland* (1992), the common law view prevailed that the Crown enjoyed absolute ownership of all the lands and that all rights in land derived from the Crown. *Mabo* recognized aboriginal Australian titles to land and focused attention on aboriginal practices in relation to land and water.

11.3 Paradigm 1: The Common Law Rules (1788–1901)

The white settlers apparently believed that water could be developed endlessly and even that rain follows the plough (Sinclair 2001). They therefore treated water as a free good and applied the English common law to resolve disputes over water. The doctrine of riparian rights conferred limited water rights on landowners across or along whose land water flowed in a defined surface channel (Clarke & Renard 1970; Rochford 2004). The riparian doctrine only gave a usufructuary right to water; ownership remained vested in society and riparian owners were limited to making reasonable uses (*Embury v. Owen* 1851). A reasonable use was held to allow use 'without sensible diminution or increase and without sensible alteration in the character or quality' (*Young v. Bankier Distillery Co*. 1893). The common law, however, treated surface waters and groundwater differently. The groundwater rule did not

impose any limits on use, allowing owners of the land above a groundwater source to use all the water he could capture (*Ballard v. Tomlinson* 1885; *Dunn v. Collins* 1867). The unlimited right of use even extended to uses off the overlying land (*Chasemore v. Richards* 1859), even if his sole purpose is malicious intent to injure his neighbours wells (*Mayor of Bradford v. Pickles* 1895).

Such rules could only lead to the tragedy of the commons for groundwater, while the surface water rule, if strictly enforced, would prevent development of water for consumptive uses. In theory, the public trust doctrine would have supported judicial supervision of water usage, but that doctrine remained unused until it 'belatedly re-emerged' in 1994 (*Hornsby Council v. Roads & Traffic Authority* 1994). Colonial legislatures soon saw that the riparian doctrine was not suited to Australian conditions. Victoria, South Australia and New South Wales created canal distribution systems with State funding (Hallows & Thompson 1999). These straddled the Murray and its tributaries and caused political rivalries. This process of rivalry was intensified over the period leading up to Federation. It was often seen as the three way contest between the up-streamers of New South Wales and Victoria against downstream South Australia. The *Review of Reviews*, described access to the Murray as the 'most obstinate and prolonged debate in the [1898] Convention', with South Australia presented itself as a victim of the larger and more ruthless colonies of Victoria and New South Wales (Anderson 2003).

11.4 Paradigm 2: Fiscal Federalism (1901–1983)

The six Australian States agreed to federate in 1901, but water was a key stumbling block (Anderson 2003). The broad powers of the new government were listed in §51 and included trade and commerce. These powers could be construed widely (Crawford 1991; Fisher 2000) and so the States insisted on inserting §100: 'The Commonwealth shall not, by any law or regulation of trade or commerce, abridge the rights of the State or of the residents therein to the reasonable use of waters of rivers for conservation or irrigation.' The Commonwealth wanted power over water for navigation, while the States desire to use the water for irrigation. Section 100 limits §51 and also limits the Commonwealth navigation power (Quick & Garran).

The States argued that technological developments would solve water problems and that water management therefore should be left for technical experts. The environment was not considered. The States used water to develop the interior and most of Australia's large dams were built in this period (Broughton 1999). As pressure on water resources increased, State law reforms vested the bed and banks of watercourses and swamps in Crown in order to deny riparian rights and to substitute various licensing systems (Clarke 1997). Nonetheless, The High court of Australia reinforced the role of the common law for groundwater and surface waters in Australia in 1962 despite the vast differences in climate (*Gartner v. Kidman* 1962).

Pollution was first largely treated as a nuisance incidental to public health and local government functions (*Ballard v. Tomlinson* 1885; *Thorpes Ltd. v. Grant Pastoral Co*. 1955; Bates 2006: 176–178). Liability was also sometimes predicated

on a finding of negligence (*Puntoriero v. Water Administration Ministerial Corp* (1999); *Ryan v Great Lakes Council* (1999); Bates 2006: 179–185). In the late 1960s and 1970s, more comprehensive pollution control legislation was enacted, alongside other environmental protection and conservation legislation, but water pollution was treated differently compared to air pollution and the regulation of waste. Victoria enacted an exceptionally comprehensive Environment Protection Act in 1970. The Victoria act signalled a major change in attitudes towards pollution. Such early pollution control legislation was based on the command and control model prohibiting activities resulting in water pollution unless licensed, enforceable by criminal sanctions. The Commonwealth Environment Protection (Impact of Proposals) Act (1974) indicated a willingness by the Commonwealth, despite §100, to intervene in State water management through §96 of the Constitution by imposing conditions on financial assistance to the States. This approach would be used extensively by the commonwealth when working with the State Governments on the Council of Australian Government reforms. The commonwealth also was able to intervene in state water management by using the 'trade and commerce power' and 'external affairs power' under §51. These powers allowed the Commonwealth to prevent the Tasmanian State Government from building a dam in 1983 (*Commonwealth v. Tasmania* 1983). This event signalled the end of water policy being exclusively a matter of State competence.

11.5 Paradigm 3: Multi-state Cooperation (1984–1994)

Concern about the environment continued to grow. Victoria enacted a new Water Act (1989) that proclaimed environmentally sustainable developed to be the State's goal. South Australia followed with the Development Act (1993), which in §3 expresses the aim of sustainability. With the shifting of focus came a realization that the States could not solve their problems alone. Meanwhile, the Commonwealth was becoming steadily more assertive, culminating in the Environment Protection and Biodiversity Conservation Act (1999), which authorizes the Commonwealth to regulate State actions relating to wetlands. These two concerns led the States to attempt to solve water management problems through interstate cooperation, ranging from limited bilateral agreements to the Council of Australian Governments which by the mid-1990s was proposing far-reaching reforms, funded by the Commonwealth under §96.

In most States, different authorities administered surface waters and groundwater and there were few linkages between these authorities (Clarke & Renard 1970). In 1980s, the Commonwealth and the States entered into major compact to share costs for managing water in the Great Artesian Basin, the world's largest artesian basin underlying about one fifth of Australia. The water was extracted by more than 4,000 wells. By 1990, 1,000 of these had stopped flowing because of interference by nearby wells. The 1989 Artesian Basin Rehabilitation Programme aimed to encourage the capping of wells and the piping of water. The cost-sharing

scheme for bore capping and pipe work is funded 80% by State/Commonwealth and 20% by growers in New South Wales and Queensland. Yet, to the landowner, the cost of the works to save the water was too high. In 1997, the Great Artesian Basin Consultative Council consisting of groundwater users, industry, local government, traditional owners, conservation groups, and governments was established to take account of different interests.

The most elaborate attempt at cooperative water management centred on the Murray Darling basin. The Murray and the Darling Rivers are really one river, but is different reaches have different names because of the vagaries of white exploration. Its basin covers about 1,000,000 km^2 (14% of Australia) and is spread unevenly over Queensland, New South Wales, the Australian Capital Territory, Victoria, and South Australia. New South Wales, Victoria, and South Australia signed the Murray Darling Agreement in 1992, with Queensland joining in 1996 and the Australian Capital Territory in 1998. The Agreement covers the management of all natural resources and aims to reduce the salinity impacts of using river water for irrigation. Since the 1950s, as the amount of water diverted rose, related community concerns about river health increased substantially (Murray Darling Basin Commission 1999). Yet these water diversions were authorized under State law and all States tended towards permissive allocations ignoring the sustainable use of the basin—and in fact they routinely over-allocated the available water.

The Murray Darling Agreement creates a Commission to supervise the agreement. Under the agreement, each State is required to develop a hydrological model that quantifies sustainable resource use and ensures that diversions within the State do not exceed what is deemed sustainable. The States are also required to monitor and report to the Murray Darling Basin Commission on diversions made, water entitlements announced, allocations, water trading within, to, and from the State, and report on compliance with their targets. The Commission's Independent Audit Group annually audits and reports upon State performance and may order a special audit if the diversion of water to supply metropolitan Adelaide exceeds 650GL, or if the cumulative debit recorded in the Register exceeds 20% of the annual average for a particular river (Cox et al. 2006).

In June 1995, Murray Darling Ministerial Council agreed to an interim cap limited diversions for consumptive uses to what had been diverted on 30 June 1994. This cap was made permanent for New South Wales, Victoria, and South Australia from 1 July 1997. The cap aims to restrain further water diversions but does not restrict new developments provided the water necessary for them is obtained by using water more efficiently or by purchasing water from existing uses. The cap was the first step towards striking the balance between irrigation and other consumptive and in-stream uses. There is much community debate with some sectors arguing that this level still demands too much of the river and that it still is too high to halt environmental degradation (Blackmore 2000).

Over this period, groundwater use which supplied 18% of total water used nationally nearly doubled and in New South Wales, Victoria, and Western Australia the use tripled. (Audit 2000). Groundwater use increased with the onset of prolonged drought and cap-related reduced surface water allocations. In many

places, the rate of groundwater extraction exceeds the rate of recharge. Some 168 of Australia's 538 groundwater management units are close to being over-allocated, and 161 are overused.

11.6 Paradigm 4: Environmentally Sustainable Development (1994–2007)

The Council of Australian Governments agreed upon a set of reforms in 1994 to restructure water law and water management bodies in each State to form a mixture of public and private bodies (McKay 2005). The announced goal was environmentally sustainable development, with an emphasis of these reforms was to rely on markets to re-allocate water and to improve efficiency. Environmentally sustainable development aims to enhance individual and community well-being and welfare by developing the economy in ways that: safeguards the welfare of future generations; provide for equity within and between generations; and protect biological diversity and maintain essential ecological processes and life-support systems. The guiding principles include integration of economic, environmental, social and equity considerations in policymaking; the precautionary principle; recognizing the global impacts of local actions; developing a strong and diversified economy; enhancing international competitiveness in an environmentally sound manner; using cost-effective and flexible policy instruments; and community involvement in policymaking (Hamilton & Throsby 1999). This approach has driven reforms from 1994, and even a bit before that year.

As this paradigm developed, the Commonwealth came to set the standards while the States establish and administer a licensing regime (McKay & Moeller 2002). With a goal of full cost recovery, it became necessary to identify and fund community service obligations. Consumption was to be based on two tariffs, to apply to urban users in 1998, and to rural users in 2001. Trading was to be promoted in rural water entitlements, while for the first time water was to be allocated for the environment. The Council did not seem concerned that its embrace of broader social values contradicted its emphasis on markets. As a result, the tenuous and vague objectives of the reforms made implementation difficult.

Each State passed its own laws and they all chose different definitions of environmentally sustainable development. Western Australia's definition is, 'Ecologically sustainable management of land, water and air and biodiversity for the maintenance of the State for the benefit of existing and future generations, and for the maintenance of life support capability of the biosphere. It does not include mineral resources, but does include coastal and marine resources up to the three nautical mile limit.' The Victorian Act aims to 'maximize community involvement in the making and implementation of arrangements relating to the use, conservation or management of water resources.' The Queensland Act gives the power to a Minister, who is advised by a Committee of locals and others in the preparation of water plans. The South Australian Act aims 'ensure the physical, economic and

social well being of the State and facilitate the economic development of the State while protecting the entitlements of future generations and the ecosystems dependent on those resources'. The Minister appoints committees and approves plans created by Catchments Water Management Boards in prescribed areas only. The catchment water plans must be consistent with the overall State Water Plan and must provide for the allocation of water on an equitable basis and in a sustainable manner; the catchments water plans create the power to impose levies and they bind the Minister. The Minister does not have power to review or correct anomaly in the plans.

To a certain extent, these reforms were a step backwards. These Acts fostered introspection within each State, but did not provide incentives for collective action between the States or even between regions within a State. For example, the complications inherent in the legacy of uncoordinated State laws was felt in relation to water trading in the Southern Connected River Murray System spanning northern Victoria, southern New South Wales, and part of South Australia. There were over 183 categories of irrigation water entitlements, each with a different level of reliability, tenure periods, protection of the interest in the water license, and nomenclature, making trading near across State lines near impossible (Shi 2005). Numerous water supply businesses were created with varying functions. There are presently 333 water supply businesses with 14 different types of legal forms regulated under the differing State laws (McKay 2007). While Victoria, for example, has a highly coordinated and centralized water supply business environment, Queensland has diverse and chaotic water supply businesses with trusts, government departments, and local governments acting as dominant service provider in various rural and urban areas.

Regardless of these divergences, each State is required to implement environmentally sustainable development in water planning and project approval, and with an independent price regulator. In November 2000, the Council of Australian Governments agreed to a regional model for the delivery of water and a national action plan on salinity and drainage. Following this, the National Resource Management Ministerial Council adopted a model for funding of environmental activities at a regional level, leading to the integrated implementation of these programmes based on regional needs, building on local knowledge and expertise (Senate of Australia 2000). In implementing these reforms, the States began to create regional water plans in catchments and accordingly to reduce water allocations. This led to litigation challenging the changes on a variety of grounds (see, e.g., *Murray Irrigation Ltd. v. ICW Pty. Ltd*. 2005). A farmer challenged the amended Water Act of Victoria (1989) that required a licence to capture water in dams on the farmer's property. Victoria's Water Act is the most comprehensive in Australia, establishing a framework and management regime designed to ensure that upstream uses do not affect downstream users in Victoria (Pisaniello & McKay 2005). It required the plaintiff to obtain a license if he wished to continue with this practice. The act was upheld as replacing common law rights. The plaintiff even had to pay the legal costs of the State of Victoria.

The most critical challenge arose the assertion that local communities could negotiate new water sharing arrangements that would improve environmental

outcomes, but without concern about diminishing the reliability of water entitlements for other communities. In the New South Wales case of *Murrumbidgee Groundwater Preservation Association v. Minister for Natural Resources* (2005), a user interest group unsuccessfully challenged the validity of a water plan on the grounds that the extraneous purpose of the Minister in making the plan was to avoid the community drafted plan, the formula for reserving waters for the environment contained a mathematical impossibility, the uncertainty of timing of the operation of the plan, and the imposition of uniform reductions in water allocation were irrational. The appeal court stated that as there was a crisis and therefore the Minister had discretionary power to make a ground water plan. The court rejected the alleged grounds of challenge. The literal construction of the formula did provide an absurd result, which the court resolved by applying a purposive construction. The timing was capable of being certain and so valid. Finally, the court held that it was for the Minister to balance the desired environmental outcome and the chosen method of achieving it with the beneficial and adverse social and economic consequences. Also in *BGP Properties v Lake Macquarie City Council* (2004), the New South Wales Land and Environment court acknowledged the spread of environmentally sustainable development principles to 40 or so land and water use laws at state level to uphold land-use regulations that limited the subdivision of law by a real estate developer.

There is a similar division of responsibility between the Commonwealth and States and Territories in Australia regarding pollution prevention. The environmentally sustainable development policy objective, including the 'polluter pays principle' and the precautionary principle, is applicable to all jurisdictions. In 1990, the federal government set up nine working groups for specific industry sectors to assess the potential of achieving ecologically sustainable development in each sector. Under the paradigm in place after 1994, standards for environmental protection are set by the National Environment Protection Council in accordance with the National Environmental Protection Council Act (1994). This statute allows for the making of National Environment Protection Measures, which must be accompanied by impact statements setting out the costs and benefits. Such measures can only be made in relation to specific matters, which include ambient marine, estuarine, and fresh water quality, general guidelines for the assessment of site contamination, and environmental impacts associated with hazardous wastes.

The States are required to develop legislation to implement such measures within their jurisdictions (Bates 2006: 387–388). State regulation of water pollution—including anything that may result in negative environmental change or affect health and safety—has been subject to judicial interpretation. In *Electricity Commission (New South Wales) v. Environmental Protection Agency* (1992), the court emphasized that the definition had to be applied in a common sense manner, so that treating a swimming pool with chlorine did not relevantly change the condition of waters each time the chemical was added. Because state legislation now takes a more common approach, relevant matters are addressed thematically below, rather than on a state-by-state basis. Modern approaches to water pollution have considered the negative impacts upon all of environmental media, and focuses on mitigating environmental harm and promoting environmentally sustainable development. Legislation remains

however split, however, between provisions designed to prevent environmental harm and those designed to prevent environmental impact, or that regulate catchment management, site contamination, or heritage rivers.

Modern legislation usually categorizes liability for pollution in accord with the degree of harm caused. Environmental harm is described as any direct or indirect alteration of or impact upon the environment that has an adverse effect on or that degrades the environment or an aspect of it. In *Palos Verdes Estates Pty Ltd v Carbon* (1991), it was suggested that where other control regimes are in place, environmental harm is likely to be limited to the regulation of pollution. Legislation typically makes it an offence to cause environmental harm through pollution emissions. In New South Wales and Victoria, for example, environmental harm is dealt with through the commission of specific offences (Protection of the Environment Operations Act 1997 (New South Wales), Environment Protection Act 1970 (Victoria)). In the other States and Territories, environmental harm is categorized into serious environmental harm, material environmental harm, and environmental nuisance. Serious environmental harm may involve actual or potential adverse effects on the health or safety of human beings or on the environment or environmental values that have high impact or impacts that are wide-scale or irreversible. Alternatively, serious environmental harm occurs if it results in loss or property damage or clean-up or prevention costs exceeding a threshold amount. Environmental nuisance is the emission of a pollutant that unreasonably interferes with, or is likely to unreasonably interfere with, a person's enjoyment of the environment or an aspect of it because of pollution.

Central and local government in the States and Territories remain responsible for pollution management, commonly relying on an integrated assessment of land use and management so environmental planning and protection may operate through a single permitting process, although separate permissions are typically still given (e.g., Environment Operations Act 1997 (New South Wales)) introduced a single integrated environmental protection licence to replace previous multiple media specific licences. The States typically rely on best practice environmental management to balance between the cost of achieving desired quality standards and the risk of the harm occurring, although only some legislation requires it. This approach provides some flexibility in pollution control, as Bates comments: 'This is an approach which is in line with current policy to encourage industry to work out its own solutions for maximum environmental performance coupled with economic efficiency' (Bates 2006: 396).

Criminal sanctions are now just one tool available in such laws as modern legislation now typically develops environmental protection policies to guide action, including those specifically for water (Environmental Protection Agency Victoria 2003). These are often subject to a rigorous assessment process to ensure both procedural (legislative compliance) and substantive (attainment of positive environmental outcomes) effectiveness (Marsden & Ashe 2006). General duties are established in relation to the environment, and environmental management programmes enable voluntary schemes for environmental management to be introduced. Environmental protection orders now often provide executive remedies,

and judicial remedies include both criminal and civil penalties and other orders. Economic incentives are also now available in order to achieve regulatory objectives (Lipman & Bates 2002).

The licensing of proposed activity remains at the heart of environmental protection legislation and activities of environmental significance may therefore not be undertaken without a permit (e.g., Protection of the Environment Operations Act 1997 (New South Wales): §§47–49; Environment Protection Act 1970 (Victoria): §§19A, 20, 53A–53E, 53I). Primary or secondary legislation generally uses a list approach to determining which activities require permission. Licence applications are generally publicly advertised, which may also be needed for licence variations. Conditions are typically attached to licences, for example to ensure compliance with environmental standards, or require preparation of an environmental management plan. Case law has determined that licence conditions must reasonably relate to the development or use for which the licence is issued and must be reasonably certain in operation and expression (*Protean (Holdings) Ltd. v Environment Protection Authority (Victoria)* 1977). Violation of the conditions of a licence is an offence (*Environmental Protection Authority v. HTT Huntley Heritage P/L* 2003).

Unless authorized by legislation, license applications must be determined solely on environmental grounds. Thus, in *Coastal Waters Alliance of Western Australia v Environmental Protection Authority* (1996), the Supreme Court of Western Australia concluded that the EPA had exceeded its statutory authority by taking into account economic and broader commercial considerations. Economic and other relevant factors are to be taken into account in deciding on overall environmental quality objectives, but once decided on, only environmental factors are to apply to individual licence applications (Bates 2006: 412–413). Regulators sometimes require the preparation of environmental management programmes or environmental improvement programmes where existing activities fail to demonstrate compliance with regulatory requirements or where a new standard is envisaged (Marsden et al. 2000: 24–33).

A report to the Council of Australian Governments concluded, however, that the foregoing reforms had resulted in patchy and slow change, and that more dramatic policy innovations were necessary (Jones et al. 2001). Thereafter, the Council of Australian Governments produced a new approach to water management—the National Water Initiative (2004)—in an effort to achieve: objectives, outcomes and agreed actions to be undertaken by governments on water access entitlements and planning; water markets and trading; water pricing; integrated management of water for environmental and other public benefit outcomes; water resource accounting; urban water reform; knowledge and capacity building; and community partnerships and adjustment (Thompson 2005). The Commonwealth and most of the States signed onto the initiative in 2004, with Tasmania joining in 2005 and Western Australia in 2006. Once again, agreement was driven by money under §96, with $2 billion to be invested by 2010 through an Australian water fund. The National Water Initiative aims to increase the productivity and efficiency of water use and has 80 key aims, including water access, entitlements, planning, intra- and interstate water markets, and integrated management of water for environmental

and other public benefits. The initiative specifies that consumptive use of water requires a water access entitlement created through legislation as a perpetual share of the consumptive pool of either surface waters or groundwater (National Water Initiative 2004: ¶28).

11.7 Paradigm 5: Justiciable Protocols

In 2007, the then Prime Minister expressed his exasperation with the water reform process and the lack of coordination between the States under the Council of Australian Governments and the National Water Initiative (Howard 2007). This exasperation led to Commonwealth legislation taking over responsibility for water in the Murray Darling basin (Water Act 2007). This new Water Act was based on several powers in the Constitution (1901: §§51(i), (ii), (viii), (xi), (xv), (xx), (xxix) (xxxvii), (xxxix), 61, 122). It aims to create a basin plan out of adopted or approved State water plans drafted under State acts. It requires surface waters and groundwater to be managed in an integrated way in the national interest, to optimize economic, social and environmental outcomes, and to give effect to relevant international agreements (e.g., the Ramsar Convention, the Biodiversity Convention, the Desertification Convention, and the Climate Change Convention).

This Act is a new way to accrete power to the centre though the process of accrediting or adopting the State water plans. The Commonwealth, through the Murray Darling Basin Authority (a new body made up of eight independent persons), accredits or adopts State water resource plans (2007: §63). These plans must provide for the management of the water resource plan area, but only to the extent to which the water resource plan relates to basin water resources. The plans will be subject to judicial review in State and the High Court. This will eventually provide a more settled jurisprudence around issues such as environmentally sustainable development.

The new statute implies that the Commonwealth is able to set a protocol for the States to adhere to and that any disputes would be justiciable, a radical departure from the traditional understanding of States' rights regarding water. In such justiciable protocols, the power remains with the States but the commonwealth can set a protocol that the State plans must reach. This is a huge change from the paradigms under which the Commonwealth could only fiscally influence State government water planning or regulatory processes. In addition, the Commonwealth is now able to regulate water charges by all water supply businesses in the States.

11.8 Summary and Conclusions

The history of Australian water laws presents a mosaic of the common law overlain by introspective State based statutory schemes. Five paradigms were identified from 1788 to the present day. The States only agreed to a federation in 1901 if they

maintained their paramount power over water allocation. In Paradigms 3 and 4, however, the federal Government has tried to influence policy and State laws by using its fiscal and other powers in the Constitution. This has resulted in changed laws, but there still was little consistency between the various State laws even on key issues such as defining environmentally sustainable development. This led to problems, particularly regarding upstream/downstream issues. There are examples of cooperative federalism over water issues. The State-based schemes were overlain by two special Commonwealth schemes: the Murray Darling Basin Commission and the Great Artesian Basin Compact, under both of which the trans-boundary nature of the water resources were managed. These bodies, however, were underpowered. The States continued to manage these resources and allocate water in streams and aquifers without considering the interests of other States.

The continuing over use of water in conjunction with the realization of acute environmental problems led to deeper Federal intervention as described in Paradigms 3, 4 and 5. One of the early interventions through the Murray Darling Basin Commission to impose the cap on surface water use increased the pressure on groundwater. The pressure now through the National Water Initiative is to devise conjunctive use policies and to integrate surface- and groundwater uses. In relation to water quality, the States are still paramount. The Water Act 2007 aims at creating a Commonwealth water law that leaves the States with duties to draft plans but provides a legal mechanism for the Commonwealth to require conformity to the requirements of a basin plan. The national importance of the basin plan and the national objectives of the Act have been used to justify the legal power to ignore State boundaries and harmonize the water uses to achieve national, and not regional or State only, goals. Disputes over the adoption or approval of the State plans will begin to create a national jurisprudence over environmentally sustainable development and other key issues. This is indeed a profound legal change in the Australian constitutional system.

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Chapter 12
United States: The Allocation of Surface Waters

Joseph W. Dellapenna

Abstract The English settlers in North America brought with them the common law, which, while well developed in many respects, had little to say about the allocation of surface waters. With courts generally, but not always, taking the lead, the states of the United States developed over three centuries three very different legal regimes for the allocation of water: riparian rights (a common property system); appropriative rights (a private property system); and regulated riparianism (a public property system). In addition, some states apply a 'dual system'—a hybrid of riparian and appropriative rights. With water allocation remaining a state responsibility in the United States, the 50 states continue to experiment with the law of water allocation in ways that could be informative to people in other countries considering possible laws for the allocation of water.

Keywords Appropriative rights • common law • common property • private property • public property • regulated riparianism • riparian rights

12.1 Introduction

Because the allocation of water in the United States is mostly a matter of state law, there could be 50 or more different systems of law for allocating water in the United States. In fact, basically only four legal systems are found in the various states regarding surface waters and five legal systems regarding groundwater. The law of water allocation in the United States provides examples of how water law evolves in response to differing patterns of hydro-geological availability of water and of demand for water. It also provides examples of the role that courts can play in a legal regime that explicitly acknowledges the creative function of the judiciary, but demands that judges justify their conclusions through reasoned elaboration.

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In examining these different systems, one must keep in mind the admonition of Jacob Beuscher (1961: 448), that

> [t]he field of water law contains more than its fair share of judicial over-generalizations. … Over-generalization in the water law field … not only tends to blur important distinctions between states which are members of the same group, it also magnifies differences when states in one group are compared with those in another.

Attempts to summarize the complex history of water law in a particular legal tradition in a simple pattern of, for example, alternate swings between location based and use based legal regimes utterly fail to describe water law's history adequately (Scott & Coustalin 1995). This chapter briefly recounts the history of each legal doctrine used to allocate surface waters within the states of the United States. The complete story is summarized in this introduction.

The creation of a legal system for the allocation of water in the United States traces back to certain vaguely stated riparian concepts of rights in water applied in England to protect fishing in a squire's brook (Angell 1824: 5–14) or to protect the steady flow of water to milldams (Woolrych 1830: 108–23). American courts, rather than legislatures, reshaped this law into forms suitable to the new nation (Horwitz 1977: 33–53). In states to the east of Kansas City, courts accomplished this transition largely through substituting the theory of reasonable use for an earlier insistence that users must preserve the natural flow of streams with only a narrow exception for domestic or natural uses (Dellapenna 2007b: §§7.01(b), 7.02(b)–(d)). Traditional riparian rights proved even less suitable to the lands west of Kansas City, which generally become increasingly arid as one travels west until reaching another humid zone on the west coast of the United States.

From the earliest years of 'Anglo' settlement, the newcomers generally displaced aboriginal and Spanish–Mexican law (Hundley 1992: 1–77; Pisani 1992: 38–46). Because of aridity in the west, the courts there confronted increasing demands to divert water for mining, irrigation, industrial, and municipal uses that could not be resolved satisfactorily even through recourse to the reasonable use theory (Worster 1985). As Donald Carr summarized the point,

> In the arid countries of antiquity water rights predated land rights, but in the well-rained countries of Western Europe there was more interest in the ownership of land. Any equity in the water of a river depended on the land being on the bank of a river. In Western Europe the doctrine of appropriation, which made irrigation possible in the Western United States and which allows a water user whose land may be far from the river to acquire an equity in the water, would have been horrifying to Englishmen and Frenchmen, and in fact still is. (Carr 1966: 81)

The natural flow version of riparian rights would have foreclosed mining or irrigation on non-riparian lands in favour of the water flowing virtually unusable (except for the last riparian before the water flows into the sea) across riparian land. The reasonable use theory of riparian rights was too uncertain for investment (private or public) in the expensive works necessary for the diversion and use of water (Gaffney 1969; Grossfeld 1984). As a result, the states most heavily dependent on mining and irrigated agriculture utterly rejected riparian rights for disputes regarding consumptive uses and subordinated non-consumptive uses to consumptive uses. This came to be known as the Colorado doctrine, after the state whose courts first adopted these

changes (Dellapenna 2007c: §8.02(b)). Other western states, in which other livelihoods were significant, adopted riparian rights partially or wholly, only to struggle thereafter to limit or eliminate those rights in one of two forms, commonly called the California and Oregon doctrines (Dellapenna 2007c: §§8.02(a), (b), 8.03). Such riparian rights as are still recognized in western states developed important differences from riparian rights in the eastern states (Dellapenna 2007c, §8.04).

As a result, concern over water law evolved to the west of Kansas City in the direction of well defined private property rights—appropriative rights or dual systems that at least avoid the worst of the tragedy of the commons (Hardin 1968). Concern over non-consumptive uses and the public interest in managing water in western states emerged only recently. As a result, the public interest in western water has been left to occupy an uncertain and (to many) unsatisfactory position (Getches 2001). Recent decades have seen increasingly frequent and increasingly severe water shortages in the humid areas to the east of Kansas City (the domain of riparian rights), due to recurring droughts, expanding demand, or excessive pollution. Pressures to change the law of riparian rights can only accelerate under the impact of the current global climate disruption (IPCC 2007; Dellapenna 1999).

For many years, legislatures in riparian-rights states intervened to solve particular problems or crises without any overall plan of law reform. Often, these interventions were to protect non-consumptive uses, in the course of which they sometimes attempted to recognize and enforce public rights—the very opposite of the path taken in the western states (Daly 1995). In the second half of the twentieth century, legislatures in about half of the eastern states developed a new regulatory permit system based on riparian principles as the primary method for allocating the diversion of water from some or all sources—the regulated riparian system (Dellapenna 2007d). Other eastern states adopted some features of this system for management of part of their waters, sometimes in statutes long antedating the more comprehensive modern schemes.

Some legal scholars in the United States treat regulated riparianism as minor alterations of traditional riparian rights (Ausness 1983). Others treat the new laws as poorly drafted appropriative rights statutes (Trelease 1983). The American Society of Civil Engineers saw in the new laws a fundamentally different approach to water law, expressed in the society's 'Regulated Riparian Model Water Code' (American Society of Civil Engineers 2003). The Society's decision to prepare the model code recognizes that regulated riparianism differs from appropriative rights and traditional riparian rights in important ways because regulated riparianism treats water as a form of public property, rather than as either common property as under riparian rights or as private property as under appropriative rights (Dellapenna 2000).

Finally, the law for allocating groundwater has evolved differently from the law for allocating surface waters. Until well into the nineteenth century, courts and groundwater users had little knowledge of how to locate groundwater or how it behaved (Dellapenna 2003a: §19.02). The Supreme Court of Ohio stated this most clearly in *Frazier v. Brown*:

> [T]he existence, origin, movement and course of such waters, and the causes which govern and direct their movements, are so secret, occult and concealed, that an attempt to administer any set of legal rules in respect to them would be involved in hopeless uncertainty, and would be, therefore, practically impossible. (*Frazier v. Brown* 1861: 311)

Because of this dearth of knowledge, courts across the United States generally declined to decide liability claims involving groundwater, giving rise to a rule that is variously called the 'absolute dominion rule,' the 'absolute ownership rule,' or the 'rule of capture' (Dellapenna 2003b). As knowledge regarding groundwater became more developed in the twentieth century, American courts struggled to replace this rule with one or another of four other rules: the correlative rights rule (Dellapenna 2003c); the reasonable use rule (Dellapenna 2003d); appropriative rights (Anderson et al. 2001); or regulated riparianism applied to groundwater (Dellapenna 2003e). Resistance to such changes centred on claims that the change would be a taking of property for which compensation would be due (Dellapenna 2003b: §20.07). As a result, in the United States today, at least some states adhere to each of the above approaches to groundwater and which approach a state follows bears no necessary correlation to the rule applicable to surface waters (Dellapenna 2003a: §19.05(b)). Space does not allow full exploration of this complex history.

12.2 Riparian Rights in the United States

Riparian rights is a form of common property in which all persons with lawful access are entitled to determine for themselves when, where, how, and how much to use water, with no direct say from others on these decisions so long as they do not directly interfere with one another's uses (Dellapenna 2007a: §6.01(b)). There was a long debate in the United States over whether the doctrine of riparian rights was imported from Napoleon's *Code civil* (Wiel 1919) or whether that doctrine derived from the English common law (Maass & Zobel 1961). Neither version of history is correct. Despite the clear parallels between riparian rights doctrine and the Roman law theory that the air, sea, seashore, and running water are incapable of ownership except for limited usufructuary rights and the incorporation of Roman law theory into the *Code civil*, the earlier American expressions of riparian rights antedate that code and do not refer to Roman law sources (Dellapenna 2007b: §7.01(a)). Nor did the earliest American precedents reflect English law and practice. The dominant approach to water rights in England in the 1790s grounded the right to use water on 'ancient possession', that is, on long-standing enjoyment of the benefits of the stream akin to prescription or ancient custom (Getzler 2004: 117–52). Blackstone's attempt to substitute a theory that prior use of the water, however brief, gave a superior right against one who had never before been in possession was rejected by English courts, and by 1833 those courts embraced the common right of all riparian owners to the use of the flowing water (Getzler 2004: 180–327; Maass & Zobel 1961). The earlier American developments, in fact, were strong influences on the English law (Wiel 1919: 145–47).

The earliest common law case on either side of the Atlantic to express a modern theory of riparian rights is *Merritt v. Parker*, a report of a jury instruction given in New Jersey in 1795. Parker built a milldam across Rancocus Creek as early as 1780 to operate a sawmill. The millpond overflowed onto Merritt's land. In May 1793, the

state legislature confirmed Parker's right to maintain his dam. Merritt thereafter dug a trench to divert water from Parker's millpond to operate a new sawmill, returning the water to Rancocus Creek by way of a 'rivulet' across Parker's land below Parker's mill. Parker built a dam across the rivulet, flooding Merritt's sawmill. Merritt sued Parker for interfering with Merritt's use of water and Parker set up as a defence Merritt's unnatural increase of the flow of the rivulet. Chief Justice Kinsey instructed the jury thusly:

> In general it may be observed, when a man purchases a piece of land through which a natural water-course flows, he has a right to make use of it in its natural state, but not to stop or divert it to the prejudice of another. *Acqua currit, et debet currere* is the language of the law. The water flows in its natural channel, and ought always to be permitted to run there, so that all through whose land it pursues its natural course, may continue to enjoy the privilege of using it for their own purposes. It cannot legally be diverted from its course without the consent of all who have an interest in it. If it should be turned into another channel, or stopped, and this illegal step should be persisted in, I should think a jury right in giving almost any valuation which the party thus injured should think proper to affix to it. This principle lies at the bottom of all the cases which I have met with, and it is perfectly reasonable in itself, and at the same time so firmly settled as a doctrine of the law, that it should never be abandoned or departed from. (*Merritt v. Parker* 1795: 463)

In this passage, Chief Justice Kinsey's analysis vaguely referred to what might be seen as both the natural flow theory and the reasonable use theory of riparian rights, as well as possibly to prescriptive rights and possibly even prior appropriation. In fact, he referred to at least three theories succinctly in the short penultimate paragraph of the opinion:

> It is unreasonable, and the doctrine cannot be countenanced, that when one has erected a dam, and at a considerable expense has appropriated water to his own use, another person by cutting a canal shall be permitted to diminish his supply, and avail himself of the labour and work of the original owner, without defraying any portion of the expense that had been incurred, or undertaking to assist in keeping these works in repair. It would be equally unreasonable that one man should have a right to turn more water over the land of his neighbour than would naturally go in that direction; and so far as regards the right, it is altogether immaterial whether it may be productive of benefit or injury. No one has a right to compel another to have his property improved in a particular manner; it is as illegal to force him to receive a benefit as to submit to an injury. (*Merritt v. Parker* 1795: 466)

Merritt v. Parker was typical of both English and American decisions of the time. The early opinions contained no clear or coherent theory of rights to use water; rather the courts relied on an amalgam of concerns from which one can trace the natural flow theory, the reasonable use theory, the prior appropriation theory, and prescriptive rights (Wiel 1919: 140). Yet the major emphasis in *Merritt v. Parker* seemed to be on a natural flow concept of riparian rights—a decade before adoption of the Napoleonic code. *Merritt* proved highly influential in the United States, being followed by at least six other early American decisions (Dellapenna 2007b: §7.01(a)) and by James Angell in the earliest American treatise on water law (Angell 1824: 5). Given the importance of *Merritt v. Parker*, Napoleon's code could hardly have been the source of common law riparian rights. The best view of the question set forth by Ludwik Teclaff: 'Most likely, the riparian doctrine or its

ingredients came to the United States as part and parcel of the common law, and the French influence was merely incidental, helping to give it a more precise legal expression' (Teclaff 1985: 7).

One confronts greater puzzle in explaining how riparian rights branched into two theories in the nineteenth century, and then saw the theory more conducive to private property rights displaced by a theory of common property rights (Rose 1990). The early cases, including *Merritt v. Parker*, contained expressions of both riparian theories (natural flow and reasonable use), as did other leading cases of the early nineteenth century (Dellapenna 2007b: §7.01(b)). A few scholars have concluded, however, that the American common law riparian rights was always essentially a doctrine based on reasonable use (Scott & Coustalin 1995: 887–98). Most legal scholars have concluded that a transition from natural flow theory to reasonable use theory took place in the middle to late nineteenth century (Getzler 2004: 268–82). Morton Horwitz regards the transition as a primary example of nineteenth-century American courts introducing flexible development into a capital poor and technologically backward, but resource rich, United States (Horwitz 1977: 33–53). A decision from 1827, *Martin v. Bigelow*, provides direct evidence of such purposive intervention. The Vermont Supreme Court found that 'our circumstances,' evidently meaning the need to develop the economy, required the rejection of the protection of prior uses (*Martin v. Bigelow* 1827: 184). The various transformations in riparian doctrine, from its crystallization early in the nineteenth century with an the early emphasis on preserving the natural flow of streams to the later emphasis on reasonable use, represent a complex interplay between climate, stages of economic development, and inherited legal theory (Teclaff 1985: 7–8). Nowhere is this process illustrated more dramatically than in the rejection or modification of riparian rights theory in western states (see §12.3(a)).

The basic elements of riparian rights have remained constant since the early nineteenth century. The right pertains to the owner of riparian land (land contiguous to a surface water source), often on the basis that the court is simply recognizing and protecting the 'natural advantage' that goes with the land (Dellapenna 2007b: §7.02(a)). All riparians have an equal right to use of the water, with priority for 'domestic' or 'natural' wants (Dellapenna 2007b, §7.02(b)). The equal right to satisfy other wants has been measured either as an obligation to pass on the water in the same quantity and quality as it was received (the natural flow theory) (Dellapenna 2007b: §7.02(c)) or as an obligation not to cause unreasonable injury to another riparian user (the reasonable use theory) (Dellapenna 2007b: §7.02(d)). Today, courts that continue to apply riparian rights nearly always apply the reasonable use version.

The process of modifying or abandoning traditional riparian rights continues today, with many eastern states abandoning classic riparian rights in favour of a new permit system based on riparian, rather than appropriative, principles (see §9.4). Already, no state truly relies only on 'pure' riparian rights. All states have some regulatory statutes that deal with at least limited aspects of water quantity issues—at least regulating public water systems and perhaps certain other kinds of water use. Federal law has required every state to adopt significant regulations regarding

water quality issues. Still, in many eastern states the common law of riparian rights continues as the basic means to resolve disputes over the allocation of water (both quantitatively and qualitatively) between direct private users of water, and often between other kinds of direct users as well. In these states, what public regulation there is serves to protect the public interest in the waters, playing little, if any, part in the resolution of quantity disputes between individual direct users, and also not entirely pre-empting the resolution of quality disputes between such users. Lawyers and jurists will continue to struggle in those states to adapt traditional riparian theory to modern needs (Dellapenna 2007b).

12.3 Appropriative Rights and Dual Systems

European settlers in the western the United States—whether Hispanic or 'Anglo'—ignored aboriginal law without considering whether it might have been better adapted to local conditions. The Anglo settlers also generally displaced Spanish–Mexican law (Hundley 1992: 1–77; Pisani 1992). The few apparent survivals of Spanish–Mexican law seem actually to have been fictions invented by the imagination of common-law judges (Tyler 1990). Yet for practical and legal reasons, the Anglo settlers did not simply import riparian rights into the western states (Grossfeld 1984). The result initially was the emergence of dual systems recognizing both riparian and appropriative rights; eventually some states adopted only appropriative rights for the allocation of water to particular uses. Each western state has its own particular history, a history that remains important today both for resolving open questions about the use of water in the state and for coping with the increasing tension between the roles of the state and the federal governments in managing water (Dellapenna 2007c: §8.02). Here I summarize these developments in broad strokes, beginning with the evolution of the dual systems because they emerged earlier in the western states.

12.3.1 Dual Systems—The California and Oregon Doctrines

Large scale Anglo settlement flooded into California before other western states except Oregon and Texas. In Oregon and Texas, Anglo settlement focused on rain-fed agriculture in humid areas (Hundley 1992: 63–82). Anglo settlement in California focused on mining in the drier areas of the state. The discovery of gold at Sutter's Mill in California only months before the Treaty of Guadalupe-Hidalgo transferred a vast western region, including California, from Mexico to the United States, set off a massive gold rush. California's non-aboriginal population rose from a few thousand to over 100,000 in less than a year and to several hundred thousand within 5 years (Dunbar 1987). The newcomers settled mostly in the mountains

with little concern for agriculture. The sudden peopling of California took place without an organized government in place (Pisani 1992: 12–14). Aboriginal and Spanish–Mexican law were simply swept away, ignored by the would-be miners.

The Yankee intruders brought with them and used the only law they knew—the common law of the eastern United States (Reid 1980). Yet regarding the two most material factors in their lives—land and water—they could not use that law. Under the law of the eastern United States, the land belonged to the government until conveyed into private hands and the right to use the waters belonged to the owners of the land. The newcomers could not obtain title to the land without a regular government, yet the prospectors were unwilling to wait for its establishment. They sought the gold as trespassers and took what water they needed. Once they went beyond panning for gold and undertook placer mining, they needed a great deal of water, often considerably removed from the water's natural location. The results helped to give Americans a national mythology based on stories that were all too true: violent disputes, blood feuds, and sudden death.

The miners quickly sought to bring order to their lives through vigilante law which adapted the most elementary notion of justice: 'first in time is first in right' (Hundley 1992: 67–73). The process was well established before effective formal government was created. Government could do little more than ratify the 'customs of miners.' Justice Stephen Field later would sum the matter up for the United States Supreme Court: 'the miners … were emphatically the law-makers, as respects mining, upon the public lands in the State' (*Jennison v. Kirk* 1879: 457). In 1855, when *Irwin v. Phillips* reached the California Supreme Court, the dispute over water was between trespassers on the public domain who therefore could not claim riparian rights. Looking for a common law rationale for the customs of the mining camps, the court seized upon the doctrine of *jus tertii* (the right of one in possession is not be disturbed based on a superior right in a third party not involved in the litigation) (*Irwin v. Phillips* 1855: 146). The court also concluded that the forbearance of the governments (federal and state) to enforce their claims amounted to a license to the miners to appropriate both the land and the water (*Irwin v. Phillips* 1855: 147). The court then easily concluded that the first miner to use the water had a superior right to any miner whose use began later. Thus emerged the theory of appropriative rights, a form of private property under which the holders of water rights have rights to use water defined in terms of amount, time, location, purpose, and temporal priority of use (Dellapenna 2007a: §6.01(b)).

When shortly thereafter California courts encountered disputes between actual landowners (at first, under a Mexican land grant) on the one hand and appropriators of water (usually miners) on the other, the rationales of *Irwin v. Phillips* failed. The California Supreme Court worked out a complex theory of the relation of federal and state law that recognized both riparian and appropriative rights (Dellapenna 2007c: §8.02(a)). The California Supreme Court in *Lux v. Haggin* (1886) decided how to coordinate competing uses of water from common sources (Hundley 1992: 83–96). Most central to the California doctrine is the notion, a result of California's reliance on case law rather than legislation, that there is no cut-off of unused riparian rights. Only in the last quarter of the twentieth century has the California

Supreme Court ordered an administrative quantification of unused riparian rights (In re *Waters of Long Valley Creek* 1979). Absent such quantification, riparian rights nearly always trump appropriative rights in California.

The states on the Pacific coast north of California and the states stretching across the plains from North Dakota to Texas contained relatively humid areas where agriculture was possible without irrigation. The more humid areas were settled first in these states, and only as these lands filled and settlement spread into the drier parts of the states did pressure build to replace riparian rights with appropriative rights. All of these mixed climate states eventually adopted a dual system combining appropriative and riparian rights. The model was borrowed from California, although most other dual-system states rapidly pressed further in the direction of appropriative rights than did California (Dellapenna 2007c: §8.02(c)). These states initially received riparian rights as the dominant mode of ownership of the right to use water and recognized appropriative rights as a secondary right. When they sought to establish appropriative rights as the dominant system, these states turned to statutory or constitutional enactment to produce a dual system significantly different from California's judge-created system. This system is generally identified as the Oregon doctrine because disputes from Oregon have given the United States Supreme Court the opportunity to decide the validity of this approach.

The United States Supreme Court, in *California-Oregon Power Co. v. Beaver Portland Cement Co*. (1935), concluded that the Desert Lands Act of 1877 had delegated to the states the authority to determine the water rights within the state. This decision was soon extended to all dual system even if the Desert Lands Act did not apply to them (Dellapenna 2007c: §8.02(c)). In 1909, Oregon's legislature resolved the growing uncertainty in that state by adopting appropriative rights by statute. The statute abolished all 'unvested' water rights. The only riparian rights that survived in Oregon were those that 'vested' through beneficial use before 21 February 1909, the effective date of the water law, with new claims to use water thereafter requiring appropriation.

All the other dual system states followed essentially the same path as Oregon. Riparian rights were primary until they were cut off by statute, leaving riparian rights in use on the effective date of the statute with the highest priority, but unused riparian rights as of that date were abolished. The high plains states (Kansas, Nebraska, North Dakota, Oklahoma, and South Dakota) did not take this step until the 'dust bowl' of the 1930s—a terrible drought in which millions of hectares of land literally dried up and blew away over a period of about 5 years (Meltzer 2000). Under the Oregon approach, courts developed a complex set of rules to minimize claims based on riparian rights (Dellapenna 2007c: §§8.03, 8.04). In some dual system states, these rules have virtually eliminated riparian rights, yet in other states, particularly Nebraska and Oklahoma, courts have recently revived riparian rights for uses begun after the effective date of the state's statute (Cottingham 2006; Thorson et al. 2005: 417).

Texas has a more complex legal history because of its brief existence as an independent republic before annexation by the United States. This allowed a somewhat more robust survival of Spanish–Mexican law than elsewhere in the western states, but ultimately Texas emerged with a law of water allocation like

the Oregon doctrine (Bath 1999). One eastern state, Mississippi, followed an even more tortured path into and out of a dual system (Dellapenna 2007c: §8.05). The state accepted pure riparian rights until, in 1956, it adopted appropriative rights by statute, and then repealed that system to replace it with a regulated riparian system in 1985.

12.3.2 Pure Appropriative Rights—The Colorado Doctrine

Failed prospectors from California joined other mineral rushes in what became other western states, carrying the customs of the mining camps with them. In the states along the spine of the Rocky Mountains, the climate was too dry ever to rely on rain fed agriculture, and thus the courts in these eight western states (Arizona, Colorado, Idaho, Montana, Nevada New Mexico, Utah, and Wyoming) mostly did not apply riparian rights to the consumptive use of surface waters at all. This approach is generally called the Colorado doctrine (Dellapenna 2007c: §8.02(b)).

To describe the Colorado doctrine as 'pure' appropriative rights is something of a misnomer even regarding surface waters, however, as courts in these states usually resort to fairly ordinary riparian rights theory to deal with disputes concerning non-consumptive uses of water. The Colorado doctrine originated in the case of *Coffin v. Left Hand Ditch Co*. in 1882 In *Coffin*, the Colorado Supreme Court construed two statutes—statutes that actually appear to endorse riparian rights—as prohibiting their application (*Coffin v. Left Hand Ditch Co*. 1882: 450–52). Ever since, the bench and bar in Colorado have accepted that 'there is no such thing as a riparian right to the use of water as against an appropriator…' (*Colorado River Water Conservation District v. Rocky Mountain Power Co*. 1965: 801).

The law of six of the other seven pure appropriative rights states more or less followed the approached developed in Colorado. Utah, with its Mormon heritage, took a somewhat different route, but came out in the end to more or less the same point as the other Colorado doctrine states (McCool 1995). Seven of these states, and the dual system states, developed an increasingly complex regulatory administrative structure in which new appropriators require a state permit to perfect their appropriation (Thorson et al. 2005). Colorado still relies on adjudication for administering water rights.

12.4 Regulated Riparianism

In the United States, chronic water shortages to the west of Kansas City pushed water allocation law to evolve in the direction of well defined private property rights—appropriative rights or dual systems—that at least avoided the worst of the tragedy of the commons (Dellapenna 2000; Hardin 1968). As a result, the public interest in surface waters in western states was left to occupy an uncertain and

(to many) unsatisfactory position (Getches 2001). The relative abundance of water to the east of Kansas City allowed the survival of riparian rights—a form of common property—well into the twentieth century. Only in a few instances did legislatures intervene to impose statutory regulation on riparian rights, beginning with the mill acts dating back to colonial times that gave preferences to those who invested in the construction of water-powered mills (Dellapenna 2007d: §9.02(a)). Later statutory preferences (and regulations) were occasionally extended to agriculture and other small-scale water uses (Dellapenna 2007d: §9.02(b)) and to large-scale impoundments such as hydroelectric and other dams (Dellapenna 2007d: §9.02(c)). Occasionally statutory preferences (and regulations) are found for other activities (Dellapenna 2007d: §9.02(d)). Such partial regulatory statutes are found in every riparian rights state. These limited regulations proved inadequate when, in the later twentieth century, increasingly frequent and increasingly severe water shortages arose in the humid eastern states (Dellapenna 2004). Pressures to change the law of riparian rights can only accelerate under the impact of global climate disruption (Dellapenna 1999).

Riparian rights fail on several grounds: They perpetuate uncertainty and even confusion, impeding the resolution of problems during water shortages; leave significant public interests unprotected; and discourage public and private investment in water resources. Litigation, the only means for resolving disputes under riparian rights, is time consuming and expensive, the standard of reasonable use makes the outcome of litigation unpredictable, and decisions, when reached, remain unstable—what is reasonable will change with every significant change of circumstance (Dellapenna 2007b: §7.02(d)(2)). A law student summarized the consequences:

> Unless the proprietor, by some unbelievable feat of conveyancing and legal legerdemain, acquires all or nearly all other rights along the stream, he must either curtail development on his own land, so that it will require no more water for successful operation than guesswork might show to be a reasonable amount against the claims of others in the future, or make substantial investment risking future impairment by claims which may or may not be pressed, or decline to make any improvement whatsoever that must depend upon water for gainful return. The riparian doctrine, by its rule of reasonable user, insures that all owners along the stream will be able to take *some* water at *any* time, but this insurance is at the expense of economic stability. (Boone 1950: 936)

In the face of these shortcomings, few disputes over consumptive water uses reached the courts of eastern states. It remained unclear whether this was because the relative humidity of the east allowed nearly all to obtain water without concern over legal rights, if riparian rights worked so well that litigation was unnecessary, or if riparian rights worked so poorly that few were willing to risk their access to needed water to the vagaries of such litigation. When eastern states encountered a water crisis, the state legislatures altered the law—often over the intense opposition of those the governments were trying to help (Davis et al. 1995). For many years, legislative interventions were piecemeal responses to a particular problem or crisis. In contrast with the western states, eastern courts and legislatures often sought to protect non-consumptive uses, in the course of which they sometimes recognized and enforced public rights (Dellapenna 2007d: §9.05).

Eventually, given the limited effectiveness of pure riparian rights during times of major water shortage and the unworkability of importing appropriative rights into the eastern states (Dellapenna 2007c: §8.05), about half of the eastern states developed a new regulatory permit system based on riparian principles as their primary method for allocating the consumptive use of water (Dellapenna 2007d). Other eastern states adopted some features of this system for management of part of their water. The new system is most comprehensively set forth in the American Society of Civil Engineers' *Regulated Riparian Model Water Code* (2003). The new system adopts a public property approach to water as contrasted with the common property approach of riparian rights or the private property approach of appropriative rights (Dellapenna 2007a, §6.01(b))—a system in which water belongs to the community and is managed collectively (Harris 1995).

The name 'regulated riparianism' captures the two significant elements of the new approach, at the risk of offending those to whom the words 'regulate' and 'riparian' are inherently contradictions, and the name now has gained acceptance among the water law community in the United States. Today more or less comprehensive regulated riparian statutes are found in 19 of the 31 states east of Kansas City and in Hawai'i (Dellapenna 2007d). The precise date of the transition from a riparian rights regime to a regulated riparian regime is not always clear because the legislation often occurred piecemeal, and for some states whether that transition has actually occurred remains debatable. Allowing for such uncertainties, the sequence for the adoption of more or less full-fledged regulated riparianism was: Maryland (1933), Iowa (1957), Wisconsin (1957), Delaware (1959), New Jersey (1965), Kentucky (1966), Florida (1972), Minnesota (1973), North Carolina (1973), Georgia (1977), New York (1979), Connecticut (1982), Arkansas (1985), Massachusetts (1985), Mississippi (1985), Hawaii (1987), Virginia (1989), Alabama (1993), and Michigan (2006). Other eastern states are actively considering such a change.

The core idea of regulated riparianism is that water is a public resource to be managed by the state in trust for the public (Dellapenna 2007d: §9.03; Dellapenna 2004). The state's managerial goals are to be achieved while protecting the private interest in using or developing water resources through time-limited permits based on the administering state agency's determination of whether a proposed use is 'reasonable.' The usual duration ranges for these permits is from 10 to 20 years, although in some states permits have shorter or longer durations. At the expiration of the permit, the administering state agency is free to re-examine whether continuance of the particular use is still reasonable. Thus far, few permits have been denied renewal outright, although the administering state agencies sometimes have imposed new, stricter conditions on permits being renewed. The administering state agency is also given broad powers and responsibilities to plan for and protect the public interest in the waters of the state, including long-term planning, the protection of minimum levels and flows, the provision of water for public use, and interventions to cope with water emergencies (Dellapenna 2007d, §9.05). Thus far, all legal challenges to the new system as a taking of property, as well as other challenges based upon asserted violations of constitutional rights, have been rejected by the courts (Dellapenna 2007d, §9.04).

12.5 Markets?

Markets really don't form part of the history of water law in the United States, for markets have almost never played a role in that process, either historically or in contemporary practice (Dellapenna 2000). There is so much advocacy of markets from the United States today, however, that one can fairly describe the question of whether markets should be used as a water management tool as an American idea (Dellapenna 2008). These proposals have produced great controversy both within the United States and internationally (Rothfeder 2001).

Much of the controversy arises from the insistence that markets are always the best way to manage all resources and to resolve virtually every question (Nelson 2001). Markets, in fact, are not always the best way to manage resources or resolve questions (Coase 1960). Tellingly, markets have not in fact played a significant role in water management (see Chapter 22, Dellapenna, this book). Even the highly touted 'examples' of water markets turn out on close examination to be state administration masquerading as a market, rather than true markets (Dellapenna 2000). By 'true markets,' I mean situations where buyers and sellers freely negotiate whether to buy or to sell, what quantities to buy or sell, and at what price.

Proffered examples, such as the California Water Bank and the Imperial Valley 'sale' to San Diego simply were not markets—they were situations in which the state selected the 'buyers' and 'sellers' and dictated the terms of the transaction, including the price and quantity (Dellapenna 2007a: §§6.02(b)(2), 6.02(b)(3)). Similar examples from other countries have proven equally illusory; only by focusing on how markets are supposed to work in theory and ignoring how they work in fact can one confidently claim that markets are suitable managerial tools for water resources (Bauer 2004). In sum, water markets have seldom been used to accomplish significant changes in the ways water is used; such markets as do exist involve relatively small amounts of water sold among similar users in a fairly small geographic setting, often simply among shareholders of a mutual ditch company or the like (Fullerton 2006; Howe & Goemans 2003; Ruml 2005).

12.6 Conclusions

The American experience with three different approaches to the law of water allocation provides instructive examples to anyone interested in the advantages and disadvantages of each approach—a common property approach (riparian rights), a public property approach (appropriative rights), and a public property approach (regulated riparianism). While the American solutions cannot simply be transplanted into another society (except perhaps certain other common law systems) because of differences in cultural and legal traditions, the American experience can provide lessons in the consequences of adopting certain legal structures. Careful examination of this experience might aid other societies in avoiding some of the shortcomings that have emerged in the American legal regimes.

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Chapter 13
United States: The Emergence of Environmental Considerations

Sandra Zellmer

Abstract This chapter traces the emergence of environmental considerations in U.S. water law, beginning with colonial America and proceeding through the Gilded Age of industrialization, the Progressive Era of wise use, the New Deal and the rise of the federal administrative state, and the modern environmental era. Early on, environmental challenges were addressed haphazardly. The federal government influenced water policy through navigational enhancements, reclamation works, and flood control, while state and local law governed water rights and public health issues. The 1970s brought uniform federal effluent limitations and protections for endangered species. The dawn of the twenty-first century increasingly sees collaborative restoration initiatives that draw on the strengths of federal, state, tribal, and local governments and citizens.

Keywords Dams • endangered species • federalism • flood control • pollution • public trust • water quality

13.1 Introduction

Early in U.S. history, colonial and, subsequently, federal and state governments focused almost exclusively on navigation. By the nineteenth century, the rapidly growing nation was facing the realities of water pollution and depletion. Although water quantity and quality are closely related, laws on water use and allocation developed long before laws on pollution and environmental integrity. Today, federal environmental legislation—the Endangered Species Act and the Clean Water Act in particular—eclipses conventional, commodity-oriented water law. This chapter traces the emergence of environmental considerations in U.S. water law, beginning with colonial America and proceeding through four significant eras in U.S. history: the Gilded Age of industrial expansion; the Progressive Era of wise use; the New Deal and the rise of the federal administrative state; and the modern environmental era.

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13.2 Colonial America and the Public Trust Doctrine

The chief water-related concern of early colonial governments involved public access to navigable waterways and fisheries (Rogers 1993: 46). When the colonies gained independence, they assumed sovereignty over navigable waters and submerged lands (Clemons 2004). Subsequent states, which entered the Union on an 'equal footing' with the original states, have the same authority unless the U.S. clearly expressed the intent to reserve the lands underlying navigable waters for federal purposes (*Pollard v. Hagan* 1845: 222–23). State power is limited by the public trust doctrine and by federal constitutional powers over commerce, public lands, and the receipt of funds (U.S. Constitution: art. I, §8, cls. 1, 3, art. IV, §3, cl.2). The public trust doctrine imposes an obligation on states, as trustees, to protect navigable waters for public use; states may not disregard their obligation to protect waterways and streambeds nor may they convey the trust corpus inconsistently with the public interest (*Illinois Central Railroad v. Illinois* 1892: 453).

From early times, Congress proclaimed that inland navigable waterways were 'common highways and forever free' for public use (Wilkinson 1989: 456–57). The federal government, led by the Army Corps of Engineers, developed navigable waters under the premise that 'rivers best serve society if they are controlled, diverted, and dammed' (McCool 2005: 1903). As population and industrial activity grew, untreated sewage and other pollutants raised public health concerns nationwide, yet little was done to correct the problem until the early 1900s (Andreen 2004: 553–554).

13.3 The Gilded Age of Industrialization

American law in the nineteenth century encouraged settlement and the exploitation of resources through homesteading, ranching, railroad expansion, and mining (Pisani 2002: xii). Conservation had low priority due to the Gilded Age mentality of unlimitless resources and laissez-faire policies.

13.3.1 Proprietary and Sovereign Interests in Water Quality

By the mid-1800s, environmental degradation from mining, milling, and sewage had become a serious threat to urban populations. Chicago was a leading example, with sewage pouring into the Chicago River and Lake Michigan (see Chapter 17, Hall, this book), leading to severe cholera outbreaks (Percival 2004: 718–720). Water disputes were largely left to private law remedies under state law, with suits seeking to vindicate property interests in water (see Dellapenna, Chapter 12, this book) as well as to rectify harms from environmental degradation. State

governments occasionally asserted the public trust doctrine to protect the public's interest in navigable waterways, tidal areas, or fisheries from excessive diversions and pollution, with varying degrees of success (Davis 1988: 380).

Water disputes between states involving interstate pollution, are heard by the U.S. Supreme Court (U.S. Constitution: art. III, §2, cl.2). One early case arose when Chicago reversed the flow of the Chicago River so the city's sewage flowed downstream into the Mississippi River above St. Louis; Missouri's claims were dismissed for failure to prove that bacteria could survive the long journey to St. Louis (*Missouri v. Illinois* 1906: 522–523). New York and New Jersey also litigated over New Jersey's discharge of raw sewage into New York Harbour (*New York v. New Jersey* 1921). New York's claim was dismissed for failure to show that the threatened invasion of rights was of 'serious magnitude' (Percival 2004: 737). A few years later, New Jersey sued New York City for polluting New York Harbour with garbage (*New Jersey v. City of New York* 1931). The Court issued an injunction prohibiting dumping, but only after the City was given time to build new incinerators.

13.3.2 Private Liability for Environmental Degradation

Early tort theories, such as nuisance and trespass, operated as a type of strict liability, whereby injured parties won redress even if the offending conduct was socially beneficial. Courts enjoined otherwise lawful uses of land for factories and other activities when a neighbour's enjoyment of water, air, or other essential amenities were adversely affected (Beuscher & Morrison 1955). Following the industrial revolution, however, plaintiffs harmed by diminished water quality could not prevail if the discharger did not act 'unreasonably'. Courts balanced the utility and economic benefit of the polluter's conduct against the costs to the plaintiff and, more broadly, impacts on the public interest. Thus, in *Pennsylvania Coal Co. v. Sanderson* (1886: 457–459), the court held that the acid mine drainage was not a nuisance even though it prevented plaintiff's enjoyment of her house next to a mountain stream, because the drainage was incidental to beneficial activities.

Plaintiffs, particularly governmental entities, had more success with public nuisance claims. A public nuisance is an activity that injuriously affects the exercise of a public right, such as fishing in a navigable stream (Hodas 1989: 883). In *Pennsylvania Railroad Co. v. Sagamore Coal Co*. (1924), the court enjoined a company from discharging polluted drainage into a creek when the discharge adversely affected the plaintiffs' right to use the water for public supply.

Trespass, an interference with exclusive possession of property, arises from a direct and immediate physical invasion of plaintiff's property (*Bradley v. American Smelting & Refining Co*. 1985: 787). Early cases held that any trespass, no matter how slight, was actionable, because of the special legal status of realty. Thus, the Montana Territorial Supreme Court declared in 1871 that there simply was 'no right to fill the channel of a creek with tailings and debris' (*Nelson v. O'Neill* 1871: 284; Bakken 2001: 97). As with nuisance, however, courts became more reluctant during

the industrial revolution to impose liability in order to protect manufacturers from 'harassment' contrary to the public good (*Bradley v. American Smelting & Refining Co*. 1985: 791).

The industrial revolution saw the rise of negligence claims, where liability was imposed for reasonably foreseeable injuries caused by a breach of a legal duty, such as a duty not to cause pollution (Davis 1990: 496). In 1884, California farmers successfully prosecuted a negligence claim against an upstream hydraulic gold mining operation that flooded their crops when the defendant permitted more water to flow than the canal could safely carry (*Harrison v. Spring Valley H.G. Co*. 1884: 381). Failure to prove causation was fatal to negligence claims (*Cauley v. United States* 1965: 869–70).

A final tort option was strict liability for injury caused by abnormally dangerous activities (*Cities Service Company v. State* 1975: 803). Such claims, however, were dismissed when the activity was considered common and its value to the community outweighed its dangerous attributes (*Fortier v. Flambeau Plastics Co*. 1991).

These tort theories are still viable today in redressing water pollution, and they are complemented by federal and state environmental legislation.

13.3.3 State Regulatory Efforts

Nineteenth century legislation to address water pollution included an 1852 California law criminalizing water pollution, an 1877 Montana law outlawing the dumping of coal slack in waters, and various state laws prohibiting poisoning drinking water or dumping animal carcasses into streams (Andreen 2003: 170–180; Bakken 2001: 97). Large cities like New York, Chicago, and Pittsburgh created health departments in the 1860s and 1870s. In 1869, Massachusetts established the first operational state health board, followed by other states. Most of these boards were 'weak and ineffectual bodies' (Andreen 2003: 179), with minimal funding and under enormous pressure to allow untreated discharges. The late nineteenth century saw increases in industrialization and laissez-faire attitudes, leading to significant externalities and concentrations of power (Gordon 2000: 173–174; Dellapenna 2007: §9.02(a)).

13.4 The Progressive Era

The Progressives, civic-minded urban reformers, believed that the government should lead in making life better for all citizens, not just the special interests. With population growth, it became apparent that the nation's natural resources were limited (Pisani 2002: 277). From around 1890 to 1920, federal policies evolved to reflect progressive ideals (Hays 1959) and states took tentative steps to control water pollution by establishing quasi-zoning systems (Andreen 2003: 182). Although many people still harboured a 'deep-seated distrust of centralized authority', particularly where property rights were concerned, the public supported the

development of policies requiring the wise use of natural resources (Haines 1996: 159; Utley & Mackintosh 1989).

13.4.1 The Rivers and Harbours Act

In the 1880s, Congress authorized the Corps of Engineers to prevent navigational obstructions, refuse, and mill wastes in New York Harbour. Congress broadened its geographic focus in the Rivers and Harbours Act (1899). The Act prohibits obstructions to navigation by dams or bridges or by the excavation, filling, or alteration of the watercourse of navigable waters of the United States (33 U.S.C. §§401, 403). Section 13 prohibits the discharge of refuse, except for municipal sewage and stormwater, into navigable waters without a Corps permit (33 U.S.C. §407). The Corps initially applied the Act only to materials that could actually impede navigation, rendering the Act ineffective (Andreen 2003: 221; Percival 2004: 741). Congress took little notice, however, until citizen groups resurrected the Act in the 1960s.

13.4.2 Water Conservation Through Reclamation

In the Reclamation Act of 1902, Congress authorized the U.S. Bureau of Reclamation to construct and operate water projects in seventeen western states to supply water to farmers residing on modest-sized tracts (Reclamation Act 1902). Federal reclamation projects promised to 'subdue worthless land,' turning deserts into gardens and converting the West into 'a commonwealth of small farms' (Pisani 2002: 272). In addition, proponents of comprehensive watershed planning assumed that large-scale federal projects would promote more efficient water use (Tarlock 2004: 1302). The programme became the largest public works initiative ever undertaken (Pisani 2002: xvi), supplying water to 20% of western farmers and irrigating ten million acres (Benson 2006: 275). Although 80% of reclamation water is dedicated to irrigation, the projects generate hydropower for six million homes and provide water for over 30 million people. Nevertheless, instead of efficient water use, its legacy was one of adverse environmental and social impacts, including unsustainable growth, exacerbated waste, and the flooding of millions of acres of land (Babbitt 2005: 124–28).

13.4.3 Flood Control

The U.S. historically dealt with flood control through the Corps of Engineers (Tarlock 2004: 1301–02). The 1920s ushered in a multifaceted federal flood-control policy, largely because of the Great Mississippi Flood of 1927 (Pisani 2002: 235; Barry 1998). The Flood Control Act (1928) 'set a precedent of direct, comprehen-

sive, and vastly expanded federal involvement in local affairs. …' (Barry 1998: 407). President Hoover's conservation agenda sought not only flood control, but also strong federal leadership in adopting and implementing a broad national programme for the full utilization of the nation's waterways: 'Every drop of water that runs to the sea without yielding its full commercial returns to the nation is an economic waste' (Pisani 2002: 243–44).

13.5 New Deal Water Policy

Progressive ideals resonated for decades and influenced the policies that responded to the Great Depression of 1929–1941. After 1933, President Roosevelt's 'New Deal' made public welfare a matter of federal concern, delegating sweeping regulatory powers to new executive agencies designed to police securities markets, bolster agricultural prices, and safeguard the workplace (Zellmer 2000: 941). Roosevelt put people to work on soil conservation districts, sewage treatment plants, dams, and other water-related projects. Many of these projects benefited the environment, but some did not. An extended drought and unprecedented losses of topsoil due to improvident agricultural policies led to the worst prolonged environmental disaster in American history (Egan 2006: 10). Nearly half of all municipal sewer systems continued to discharge raw, untreated waste (Andreen 2003: 226). New Deal policies spawned massive multi-purpose water projects, yet by treating them as local job relief rather than integrated parts of a national whole, federal water policy became highly fragmented. Bureaucratic rivalries further stymied coordinated planning (Pisani 2002: 271).

13.5.1 New Deal Flood Control Policies

The Dust Bowl years of the 1930s were followed by severe flooding on the Missouri River (Ferrell 1993: 63–67) and the Flood Control Act of 1936. The Act commits the federal government to 'improve … navigable waters … for flood-control purposes' if benefits exceed costs (33 U.S.C. §701a-1; Tarlock 2004: 1301–04). As a result, levees and other flood control projects in many basins have caused the loss of floodplains and the precipitous decline of fish and wildlife species (Zellmer 2004: 336; Houck 2006: 48–50). Although the Act's highly discretionary cost-benefit provision remains in place, since the 1970s, limitations on flood control activities have been imposed by modern environmental laws.

13.5.2 Hydropower

The Federal Power Act of 1920 requires any non-federal entity seeking to build or operate a hydroelectric project to comply with a license from the Federal Power

Commission (now known as the Federal Energy Regulatory Commission) (16 U.S.C. §817). The Commission's authority initially was limited to navigable waters and federal public lands, but was extended in 1935 to projects on all waterways subject to federal power under the Commerce Clause (Act of Aug. 26, 1935, §§202, 210). The Supreme Court described the Act as 'a complete scheme …which would promote the comprehensive development of the water resources of the nation. …' (*First Iowa Hydro-Electric Coop. v. Federal Power Comm'n* 1946: 180). The Court held that the Act pre-empted state laws that were inconsistent with Commission licenses (*First Iowa Hydro-Electric Coop. v. Federal Power Comm'n* 1946: 164, 177–81). Subsequently, the Court distinguished the Federal Power Act from the Reclamation Act, which requires the Bureau 'to proceed in conformity with' relevant state laws (*California v. Federal Energy Regulatory Commission* 1990: 504–06).

Today, the Commission has authority to impose a broad array of license conditions, such as fisheries protection and flood control. Although environmental considerations played little role in early licensing decisions (Lawrence 2005: 285), in 1967 the Supreme Court held that when the Commission determines whether a hydroelectric license is in the public interest, it must explore all relevant issues, including future power demand and supply, alternate power sources, preserving reaches of wild rivers and wilderness areas, preservation of anadromous fish for commercial and recreational purposes, and protection of wildlife (*Udall v. Federal Power Comm'n* 1967: 450). Congress further modified the licensing process, requiring the Commission to give 'equal consideration' to 'the preservation of … environmental quality' (Lawrence 2005: 285). The Commission also must prepare a cumulative impact assessment of projects within the river basin and accept any conditions on licenses recommended by state or federal agencies or explain in writing why it rejected them (Spence 1999: 430).

The nation's dam-building zeal spread well beyond hydropower facilities (Klein 1999: 641–642). All told, the Corps of Engineers built nearly 500 dams, the Bureau of Reclamation around 600 dams, and the Tennessee Valley Authority, created in 1933, some 51 dams on the Tennessee River and its tributaries (Adler 1995: 1060–61; Bureau of Reclamation—About Us (2008); McCool 2005: 1905). Hydraulic infrastructure has provided extensive benefits, including water supplies, power, and commercial and recreational navigation, but the costs are high (McCool 2005: 1905). Every major river has been altered by dams, which diminish water quality, block fish passage, and destroy riparian communities. Less than 2% of America's streams remain free-flowing enough to qualify for inclusion in the Wild and Scenic River programme (McCool 2005: 1908).

13.6 The Modern Environmental Era

Industrial expansion and hydraulic works brought tremendous damage to riparian ecosystems. By the 1960s, some states had begun controlling water pollution, but opposition from industry and municipalities discouraged most state authorities

from imposing strict regulatory schemes (Andreen 2003: 189–193). Congress therefore enacted laws aimed at preserving free-flowing rivers and water quality, while litigation under the Rivers and Harbours Act of 1899 blossomed.

13.6.1 The Wild and Scenic Rivers Act

Congress enacted the Wild and Scenic Rivers Act in 1968 to counter the adverse effects of decades of dam building and flow alterations (16 U.S.C. §§1271–1287; Tarlock & Tippy 1970). The Act proclaims the need to complement the national policy of dam construction with 'a policy that would preserve … selected rivers or sections thereof in their free-flowing conditions to protect the water quality of such rivers …' (§1271). Rivers are added to the Wild and Scenic Rivers System by Congress or through state nominations to protect their free-flowing condition and other 'outstandingly remarkable values', such as water quality, recreation, scenery, fish, wildlife, or cultural resources 'for the benefit and enjoyment of present and future generations' (§1271). The Act aims to preserve free-flowing conditions and to protect and enhance river values (§§1273(a), 1278(a); Diedrich 2002: 5). Designations result in strict controls within the river's corridor (Colburn 2005: 458 n.166; Spence 1999: 426). No dam or other project under the Federal Power Act may be licensed on any designated river (§1278(a); *City of Klamath Falls v. Babbitt* 1996). The Act also prohibits federal agencies from assisting 'by loan, grant, license or otherwise' in the construction of any hydraulic works that would have a direct and adverse effect on a designated river (§1278(a); *Sierra Club North Star Chapter v. Pena* 1998: 979). Finally, designated rivers must be managed 'to protect and enhance' outstandingly remarkable values (§1281(a)). Emphasis is given to 'aesthetic, scenic, historic, archaeological and scientific features,' and to exceptional water quality (§1281(a)).

13.6.2 Federal Water Quality Acts Through 1970

World War II 'spawned a chemical revolution' and consequent pollution (Andreen 2004: 553–54). Congress enacted weak provisions for federal abatement of interstate pollution in the Federal Water Pollution Control Act (1948), along with expanded federal research activities and aid for sewage treatment, but left primary responsibility for water quality with the states (Andreen 2003: 291). The Surgeon General was authorized only to investigate a specific pollution problems at the request of a state, and the states were given power to veto any federal enforcement suit that followed (Andreen 2003: 238–39). Prosecutors were required to prove that a polluter had actually endangered public health in an adjacent state and that preventing pollution was physically and economically feasible.

By 1961, the condition of America's rivers was so poor that the Surgeon General called it 'a national disgrace' (Andreen 2003: 241). Inspired by Rachel Carson's *Silent*

Spring and an emerging environmental consciousness, the public demanded greater protection (Andreen 2003: 244–245). Amendments in 1961 extended enforcement authority to navigable waters and tributaries where discharges endangered health or welfare (Federal Water Pollution Control Act Amendments 1961). Federal power over intrastate pollution was still quite limited, however, as no suit could be filed absent consent of the state governor (Andreen 2003: 242–43). Congress strengthened the federal government's ability to combat oil pollution in the wake of well-publicized spills such as the wreck of the Torrey Canyon and the 1969 Santa Barbara blowout. Amendments adopted in 1970 prohibited discharges of harmful quantities of oil into navigable waters and imposed hefty fines and strict liability on violators (Water Quality Improvement Act 1970). The 1970 Act also required applicants for federal licenses to obtain state certification that discharges from the proposed activity would not violate state standards (Andreen 2003: 257–58).

13.6.3 The Revitalization of the Rivers & Harbours Act of 1899

The enforcement provisions of the Federal Water Pollution Control Act were so cumbersome that, in the mid-1960s, citizens began to use the Rivers and Harbours Act of 1899 to bring private actions against polluters, and also pressured the Corps of Engineers to enforce the Act more aggressively to prevent the discharge of refuse in navigable waters. The Supreme Court held that the Act could be used to enjoin industrial pollution, regardless of whether endangerment to health could be proven (*United States v. Republic Steel Corp*. 1960; *United States v. Standard Oil Co*. 1966). Over 60 enforcement actions were begun under the Rivers and Harbours Act in 1969 and 1970. Even so, the number of polluters continued to grow. President Nixon created the U.S. Environmental Protection Agency in 1970 to address such problems (Andreen 2003: 256).

The Corps of Engineers adopted regulations in 1971 for a permit programme covering 'all direct and indirect discharges' into navigable waterways or tributaries (Andreen 2003: 259–60). In issuing permits, the Corps was required to obtain the Environmental Protection Agency's advice regarding compliance with water quality standards. Setting permit levels was a daunting task given the limited data and technical resources available and joint administration was awkward. The programme soon 'ground to a halt' when a federal court prohibited the issuance of permits for failure to comply with the recently enacted National Environmental Policy Act (*Kalur v. Resor* 1971). The Corps had only issued 20 permits, and 23,000 applications remained in the pipeline (Andreen 2003: 260).

13.6.4 Environmental Impact Analysis

Congress enacted the National Environmental Policy Act in 1969 to require federal agencies to prepare an environmental impact statement for 'every recommendation or report on proposals … and other major federal actions significantly affecting the

quality of the human environment' (42 U.S.C. §4332(2)(c); *Robertson v. Methow Valley Citizens Council* 1989). Although this is a limited duty that is wholly procedural and does not force any particular substantive outcome, the Act has wrought extensive changes in the way agencies do business. Environmental analyses provide the information needed by decision makers and stakeholders to evaluate the merits of proposed projects; once details are exposed in this public fashion, political pressure can be brought to bear (Karkkainen 2002: 907). As a result, numerous water projects have been altered to minimize effects on the environment (*Marsh v. Oregon Natural Resources Council* 1989; *Dubois v. Department of Agriculture* 1996).

13.6.5 The Clean Water Act

In the early 1970s, water quality continued to worsen and water-dependent species were suffering (Andreen 2003: 198). In the Clean Water Act of 1972, Congress substantially amended the pre-existing Federal Water Pollution Control Act (33 U.S.C. §1251 note). The Act sets ambitious goals of eliminating water pollution and protecting the chemical, physical, and biological integrity of U.S. waters (33 U.S.C. §1251(a)). The Act imposes permit requirements on discharges of pollutants into surface waters and adjacent wetlands, strengthens enforcement provisions, supports state and tribal water quality standards, and incorporates elements of 'cooperative federalism' to enhance implementation.

13.6.5.1 Discharge Permits

The primary mechanism for accomplishing the Clean Water Act's goals is §301, prohibiting the 'discharge of any pollutant by any person' unless that person obtains a permit either under §402 (the National Pollution Discharge Elimination System) or §404 (dredging and filling) (33 U.S.C. §§1311(a), 1342, 1344). The trigger for both permit requirements is the 'discharge of a pollutant,' defined as 'any addition of any pollutant to navigable waters from any point source' (33 U.S.C. §1362(12)). 'Point source' means 'any discernible, confined and discrete conveyance,' including pipes, ditches, canals, concentrated animal feeding operations and other conduits, except 'agricultural stormwater discharges and return flows from irrigated agriculture' (33 U.S.C. §§1362(14), 1342(*l*)(2)). Pollutants include garbage, sewage, chemical wastes, biological materials, and even heat (33 U.S.C. §1362(6)).

'Navigable waters' is defined as 'waters of the United States' (33 U.S.C. §1362(7)). In *United States v. Riverside Bayview Homes* (1985: 133), the Supreme Court upheld federal jurisdiction over wetlands adjacent to a navigable lake, stating that the term 'navigable' was of 'limited' importance in determining Clean Water Act jurisdiction. Subsequently, the Court refused to extend the Act to a man-made wetland with no connection to a navigable waterway, stating that to do so would 'result in significant impingement of the States' traditional and primary power over

land and water use' (*Solid Waste Authority of Northern Cook County v. Army Corps of Engineers* 2001: 172–74). At present, the agencies require a 'significant nexus' with a navigable water body to assert jurisdiction (*Rapanos v. United States* 2006: 779–780).

Permits for point source discharges under the Act must incorporate effluent limitations reflecting the best available technology (33 U.S.C. §1311(b)(2)(A). Around 100,000 facilities have obtained permits (Environmental Protection Agency 2005). Most permits are issued by state agencies with delegated authority from the Environmental Protection Agency. Permit requirements may be enforced through injunctions, administrative, civil and criminal penalties, and citizen suits (33 U.S.C. §§1319, 1365). As a result, chemical pollutants from point sources have been reduced significantly. Unfortunately, non-point source pollution remains virtually uncontrolled. Programmes directed at non-point sources, which include a broad range of activities such as farming and construction run-off, are left to the states. The Environmental Protection Agency lacks direct regulatory authority, but may withhold funding for states that do not take timely steps to address non-point pollution (Adler 2003: 47–56).

States are required to establish water quality standards comprised of designated uses for waterways within the state and standards sufficient to meet those uses (33 U.S.C. §1313). If the states fail to do so, the Environmental Protection Agency must promulgate water quality standards. Waterways that do not meet the standards are listed as impaired and total maximum daily loads must be set. Total maximum daily loads are applied to point sources through the permit programme, but mechanisms for applying them to non-point sources are unclear (Adler 2003: 57). As a result, the implementation of water quality standards has been 'less than stellar' (Houck 2002: 5, 63), and both urban and rural watersheds remain impaired with pathogens, insecticides, nutrients, and sediments. Riparian areas, moreover, are 'some of the most severely altered landscapes in the country' (Adler 2003: 47, 50).

13.6.5.2 Protecting Wetlands Through Dredge and Fill Permits

By recognizing that wetlands provide a variety of ecosystem services worthy of protection, §404 of the Clean Water Act reflects a sea change in national wetlands policies. Section 404 authorizes the Corps to issue permits 'for the discharge of dredged or fill material … at specified disposal sites' (33 U.S.C. §1344(a)). The Environmental Protection Agency retains oversight and veto power over the permits. Individual permits are evaluated on a case-by-case basis, while general or nationwide permits may be issued for categories of activities that are similar in nature and have only minimal impacts. To receive an individual permit, the project proponent must demonstrate that there are no practical alternatives to the destruction of wetlands. A practical alternative presumably exists if the project is not water-dependent (40 C.F.R. 230.10(a)). Second, steps must be taken to mitigate adverse effects on wetlands (40 C.F.R. 230.10(d)). Finally, if damage cannot be avoided, the permittee must create or protect other wetlands. Section 404 is

complemented by the Swampbuster programme of the Food Security Act (1985), which removes incentives to drain wetlands by withholding subsidies from farmers who produce crops on converted wetlands (Kalen 1993: 906 n.175). These acts caused the rate of wetland loss to slow considerably, yet between 1986 and 1997, over 640,000 acres (260,000 ha) were lost (Adler 2003: 52).

13.6.5.3 Cooperative Federalism

The Clean Water Act directs federal agencies to cooperate with states in developing solutions to prevent pollution 'in concert with programmes for managing water resources' (33 U.S.C. §1251(g)). The Environmental Protection Agency delegates authority to states and tribes that meet statutory criteria to administer and enforce permit systems. Upon delegation, the Agency's permit programme is suspended, but it may still review and veto proposed permits and must periodically review state or tribal administration to ensure compliance (33 U.S.C. §1342(b)–(c)). Some states and Indian tribes have utilized their ability to administer Clean Water Act programmes to impose requirements that are more protective than federal law (*City of Albuquerque v. Browner* 1996). Section 401 of the Act, moreover, requires applicants for federal licenses to obtain certification from the appropriate state or tribal agency that the proposed project will not impair water quality (33 U.S.C. 1341(a); Spence 1999: 427). States have utilized this provision to impose minimum stream flow requirements on hydropower projects (*S.D. Warren Co. v. Maine Bd. of Environmental Protection* 2006); *PUD No. 1 of Jefferson County v. Washington Dept. of Ecology* 1994).

13.6.5.4 Citizen Enforcement Measures

The successes of the Clean Water Act are attributed in part to public involvement (Plater 1999: 382–83 n.54). The Act provides for a public comment period before a permit may be issued (33 U.S.C. §1342(a)(1)). Once a decision is made, interested persons may request a hearing before the permitting agency or bring a citizens' suit in federal court (33 U.S.C. §§1319, 1365). Successful plaintiffs can recoup attorneys' fees and costs. Ironically, the Act has been construed as pre-empting the federal common law of interstate water pollution (*City of Milwaukee v. Illinois* 1981: 313–14, 317–39). State law remedies remain intact (*Exxon Shipping Co. v. Baker* 2008: *10).

13.6.6 The Safe Drinking Water Act

In 1974, Congress responded to the public's concerns about health risks from contaminated groundwater by enacting the Safe Drinking Water Act (42 U.S.C.

§§300f-300j-26). Previous enactments had authorized the establishment of standards for bacteriological and some chemical contaminants in drinking water supplies, but only for interstate carriers and other limited circumstances (Cox 1997: 70). The Safe Drinking Water Act goes much further, regulating many types of contaminants in public drinking water systems—one that 'has at least fifteen service connections or regularly serves at least twenty-five individuals' (42 U.S.C. §300f(4)(A)). The Safe Drinking Water Act has four key requirements: establishment of national drinking water standards; regulation of underground injection wells; protection of aquifers that are the sole source of municipal drinking water; and protection of areas surrounding wellheads for municipal supplies. Actual implementation of the standards is left to the states under a delegation from the Agency; absent a delegation, administration is a federal responsibility (42 U.S.C. §§300g-1–300g-3, 300g-5; Cox 1997: 70–71).

Today, the Safe Drinking Water Act covers some 200,000 public water systems serving over 240 million people (Steinzor 1996: 192). 'This single measure has done more to improve the health status of the community, and at a lower cost, than any other achievement, not excepting immunization, advances in medical technology, or modern medical treatments and drugs' (Schneeweiss 1997: 77–78). Yet gaps remain. The Act protects only public, not private, drinking supplies. Groundwater is covered if used for public drinking supply, but not if used for agriculture or industry. Even covered drinking supplies may still contain substances posing 'relatively high human health risks' (Steinzor 1996: 185). Lack of funding and under-enforcement are at the root of the problems (Steinzor 1996: 221). Regulators find it difficult to prosecute municipalities and small system operators 'in light of the political clout of the former group and hapless ineptitude of the latter' (Steinzor 1996: 221). As with the Clean Water Act, citizens' suits are important in filling the enforcement gap.

13.6.7 The Endangered Species Act

The Endangered Species Act is a focal point for debates over the limits of regulatory power and the respective roles of private actors and governments in environmental protection (Doremus 2001: 50; Zellmer 2004: 320). In some cases, the Act has provoked dramatic changes in water usage. The first major battleground between development and environmental interests arose in *Tennessee Valley Authority v. Hill* (1978). The Supreme Court upheld an injunction of a nearly completed multimillion dollar dam because it would jeopardize an endangered fish, finding 'that Congress intended endangered species to be afforded the highest of priorities.'

The Endangered Species Act instructs all federal agencies to use existing authorities to conserve listed species (16 U.S.C. §1536(a)(1)), and directs federal agencies to cooperate with state and local agencies on water resource issues relating to endangered species (16 U.S.C. §1531(c)(2)). Section 9, applicable to all persons,

forbids the 'take' of any member of a listed species of fish or wildlife (16 U.S.C. §1538(a)(1)(B)). 'Take' includes harassing, harming, and killing listed species, as well as 'significant habitat modification or degradation where it actually kills or injures wildlife,' whether on private or public land (16 U.S.C. §1532(19); *United States v. Glenn-Colusa Irrigation District* 1992: 1129–30; *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon* 1995). Section 7, which applies only to federal agencies, prohibits agencies from taking any action that may jeopardize the survival or recovery of listed species or adversely modify critical habitat (16 U.S.C. §1536). Accordingly, neither the Corps nor the Environmental Protection Agency may issue a Clean Water Act permit if the proposed discharge would jeopardize listed species (40 C.F.R. §230.10(b)(3); *National Association of Homebuilders v. Defenders of Wildlife 2007*: 2533). Moreover, because the Bureau of Reclamation is bound by §7, its requirements have been applied to both new and existing water supply projects (*Riverside Irrigation District v. Andrews* 1985: 512; *Klamath Water Users Ass'n v. Patterson* 1999: 1213; *O'Neill v. United States* 1995: 687). Although persons holding state-sanctioned water rights are not privileged to disregard the Act, they must be compensated if their property rights are infringed (*United States v. Glenn-Colusa Irrigation Dist*. 1992: 1134; *Tulare Lake Basin Water Storage Dist. v. United States* 2001).

Procedurally, §7 requires federal agencies to consult with the U.S. Fish and Wildlife Service or, for marine species, with National Oceanic and Atmospheric Administration Fisheries Service for a Biological Opinion if an agency's proposed action may adversely affect listed species (16 U.S.C. §1532(b)). If the Service determines that the proposed action may jeopardize the species, it must suggest 'reasonable and prudent alternatives'. If the action agency wants to go ahead despite a jeopardy opinion, it may seek an exemption from the Endangered Species Committee, also known as the 'God Squad.' The proponent must show that there are no alternatives, that the benefits of the project outweigh the benefits of conserving the species, and that the project is in the public interest (16 U.S.C. §§1536(e), (h)(1)). Exceptions are rare.

13.6.8 State Instream Flow Laws

State water law historically considered water left in a stream to be wasted. State legislatures recently have adopted statutes requiring maintenance of instream flows, primarily for fish, wildlife, or recreation and, in some cases, for water quality and aesthetics (Covell 1998: 178). Florida law, for example, requires local water districts to establish minimum flows for all watercourses within their jurisdiction at the point at which further withdrawals could be 'significantly harmful to the water resources or ecology of the area' (Fla. Stat. Ann. §373.042(1)(b)). Instream flow requirements have become increasingly valuable for protecting the ecological and economic values of rivers and streams.

13.7 Looking Forward

In recent years, citizens' groups, state and federal agencies, and Indian tribes have initiated restoration efforts on great rivers, such as the Colorado River, entire watersheds, such as the Florida Everglades, and many smaller water bodies. Most restoration initiatives strive to replicate natural flows to meet the needs of native species and to enhance water quality while promoting sustainability and resilience of the system. Approaches range from dam removal to less drastic measures like flood plain protection, altering flow regimes to replicate natural conditions, and habitat construction (Adler 2007). Restoration requires a significant shift in attitudes towards water management. Although the expansion of restoration priorities is 'ad hoc, uneven, and not fully supported by adequate authority or funding' (Tarlock 2004: 1308–09), since the 1990s restoration opportunities have cropped up through federal licensing and regulatory requirements.

The re-licensing process under the Federal Power Act has been an indispensable tool (Getches 2001: 47; McCool 2005: 1907). To date, over 500 dams of various sizes have been removed nationwide (Gleick 2006: 6). Other federal agencies have also begun to embrace ecosystem restoration as a priority. The Corps of Engineers, for example, has adopted Environmental Operating Principles to inform its decisions and Congress has expressly identified environmental protection as a central mission for the Corps (33 U.S.C. §2316(a); Army Corps of Engineers 2003: iii). When restoration goals require alterations in water supply, holders of vested water rights can impede or cooperate with the project. An example of a promising cooperative effort can be seen in California, where a large-scale effort known as CALFED brought state and federal agencies together with agricultural, environmental, commercial, and municipal interests in the Sacramento and San Joaquin River Delta to agree upon a comprehensive plan to ensure reliable supplies, promote more efficient water uses, and improve water quality and ecological conditions (Gaines 2002: 164–65).

13.8 Conclusion

The picture of environmental quality of U.S. waterways is far brighter than in the past. Significant gains have been made in reducing point source pollution. Many watersheds, however, remain impaired by hydrological alterations and non-point source pollution. The cooperative federalism structure of modern environmental laws has facilitated pollution control efforts, but tensions between private, state, tribal, and federal actors continue to pose impediments to long-lasting resilient solutions, particularly in areas of jurisdictional overlap such as wetlands protection and flow impairments. Rigorous enforcement of uniform, nationwide environmental standards, coupled with innovative watershed restoration partnerships, will hold the key to future successes.

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Part III
Evolving Supranational and Regional Water Law and Politics

Chapter 14
European Community Water Policy

Paulo Canelas de Castro

Abstract This chapter traces the development of the European Community water policy. Against a background of a sense that action was urgent, a formal environmental protection policy was 'constitutionalized' for the first time by the Single European Act (1986). Community water policy entered a new stage with the adoption of the Water Framework Directive (2000) and the subsequent establishment of the Common Implementation Strategy. These changes amount to a true paradigm-shift whereby Community water policy became functionally oriented towards sustainable development and meeting the expectations of European citizens.

Keywords Common Implementation Strategy • European Community • European Union • public • supranational • Water Framework Directive

14.1 Introduction

Although closely related, the European Community and the European Union do not coincide. The European Union results from the Treaty on European Union (Treaty of Maastricht 1992, as amended by the Treaty of Amsterdam 1997 and the Treaty of Nice 2001). Today, there are two European Communities: the European Community (successor to the European Economic Community) and the European Atomic Energy Community (EURATOM), which have the same Member States, currently 27—France, Germany, Italy, Belgium, Luxemburg, the Netherlands (the six founding Members); Great Britain, Denmark, Ireland (accession: 1973); Greece (accession: 1980); Portugal, Spain (accession: 1986); Austria, Finland, Sweden (accession: 1995); Estonia, Latvia, Lithuania, Poland, Czech Republic, Hungary, Slovakia, Slovenia, Cyprus, Malta (accession: 2005); Bulgaria

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and Rumania (accession: 2007). The former European Coal and Steel Community, established in 1951 to last for 50 years, came to the end in 2002.

These 'supranational' Organizations (*van Gend & Loos* 1963) are competent to enter international agreements with third States and to adopt legislation binding on Member States, characteristics which differentiate the European Communities from the European Union. Irrespective of their autonomous character, the European Community and the European Union share the same bodies to a great extent (Treaty of Maastricht: arts. 3–5; Treaty of Rome I: art. 7). The European Union refers to the cooperation framework of the Member States and the institutional structures, thus encompassing the Community. Both pursue cooperation and policies common to the Member States according to the competences and powers conferred by the Member States. The European Community pursues policies particularly in the economic area (the 'first pillar' of the European Union), while the European Union develops policies on external affairs (the 'second pillar') and internal matters ('third pillar'). This chapter uses both terms, preferring European Community to address legal technicalities and European Union to refer to the more comprehensive political entity.

Human and ecosystem health and development depend on the quantity and quality of water. Unfortunately, since the Industrial Revolution, European waters have become increasingly polluted. Most European rivers were treated as a convenient way of transporting waste, thus affecting ecosystems along thousands of kilometres of waterways, harming human health, and polluting coastal and marine waters (European Environment Agency 2005). Europeans have consistently expressed deep concerns about their waters; it is their single most lasting environmental concern (Special Eurobarometer 2004; Water Framework Directive 2000: preamble). Even when, in 2008, climate change was prioritized over water (European Commission 2008), it is still to water, to a significant degree, that they are pointing to, water policies being particularly crucial to climate change adaptation (Canelas de Castro 2007). Member States of the European Union have not, over the years, managed fully to meet the challenges created by this state of affairs. On the contrary, surface waters and ground waters have generally evidenced a poor status. A recent survey of water quality found that around 60% of the European water bodies fail to meet even minimal quality criteria and 20% of surface waters are seriously polluted, with 87% of groundwater equally badly polluted (European Environment Agency 2003; Eutrophication Steering Group 2004). Moreover, 60% of European water services overexploit aquifers and 50% of the wetlands are at risk due to excessive exploitation of ground waters.

Against this background of common concern, formal environmental protection policy was 'constitutionalized' for the first time by the Single European Act (1986). Community water policy entered a new stage with the adoption in 2000 of the Water Framework Directive and subsequently the establishment of the Common Implementation Strategy. These momentous changes amount to a true paradigm-shift whereby the newer Community water policy becomes functionally oriented towards sustainable development and meeting the expectations of European citizens.

14.2 Policy on the Move

In spite of not being identified as such, the European Union does have a specific policy for water matters, a fact made explicit in the caption of the Water Framework Directive as well as its preamble (2000). Community water policy is one of the oldest and most densely regulated areas of environmental protection. It has also been, steadily, one of the most enduring expressions of Community Law. European Community water policy has continually evolved since it germinated in the early 1970s with the First Environmental Action Programme. This section examines the evolution of Community water policy from the first directives on the protection of certain waters and the establishment of water quality objectives (e.g., Directive 75/440/EEC 1975—on surface water for drinking) and emission limits for some hazardous substances (e.g., Directive 76/464/EEC 1976—on the discharge of dangerous substances), to contemporary policy.

14.2.1 'Constitutional' Changes

The founding Treaties of the European Communities and of the European Union are often described as 'the European Constitution'. The European Constitution, then, essentially consists of the Treaty of Paris (1951, creating the European Coal and Steel Community), the Treaty of Rome I (1957), creating the European Economic Community), and the Treaty of Rome II (1957, creating EURATOM), and the Treaty of Maastricht (1992, creating the European Union). These were amended by the Single European Act (1986), the Treaty of Amsterdam (1997), and the Treaty of Nice (2001), as well as the Accession Treaties between the Community and the new Member States. Some provisions generally or even directly relating to water, were embedded in the constitutional layer of European Union environmental law (Treaty of Maastricht 1992: preamble; Treaty of Rome I 1957, as amended: arts. 2, 3(1), 6).

There have been some significant changes in the relevant constitutional rules. The Single European Act (1986: art. 130-S) for the first time addressed environmental and therefore water policy. Apart from the general adjustment resulting from the Treaty of Maastricht (1992) shared with other policies, whereby the (main) decision-making in the field evolved from the traditional unanimity requirement towards a qualified majority rule within the Council and a co-decision procedure involving the participation of the Council and the European Parliament (thus lending this latter institution a stronger weight in the global decision-making process), the Treaty of Amsterdam (1997: arts. 174–176) renumbered and revised the applicable provisions.

Demand for a more specific water policy led to the amendment of the European Community Treaty to incorporate case law of the European Court of Justice that limited the apparent unanimity requirements for water policy to quantitative water

management only (Loibl 2000: 113–114), leaving the general rule of co-decision enshrined in article 175(1) for most of the water management issues: including both water quality management decisions and those where quantity management is ancillary to quality management, as well as general measures of environmental protection. Article 175 reads as follows:

1. The Council, acting in accordance with the procedure referred to in article 251 and after consulting the Economic and Social Committee and the Committee of the Regions, shall decide what action is to be taken by the Community in order to achieve the objectives referred to in article 174.
2. By way of derogation from the decision-making procedure provided for in paragraph 1 and without prejudice to article 95, the Council, acting unanimously on a proposal from the Commission and after consulting the European Parliament, the Economic and Social Committee and the Committee of the Regions, shall adopt:
   - Provisions primarily of a fiscal nature
   - Measures affecting
     - Town and country planning
     - Quantitative management of water resources or affecting, directly or indirectly, the availability of those resources
     - Land use, with the exception of waste management
   - Measures significantly affecting a Member State's choice between different energy sources and the general structure of its energy supply

   The Council may, under the conditions laid down in the first subparagraph, define those matters referred to in this paragraph on which decisions are to be taken by a qualified majority.

The proposed Treaty of Lisbon preserves this balance.

14.2.2 'Legislative' Changes

The evolving character of European water policy is even more pronounced at what may be termed the legislative level. At this level, the European Union's attention to water matters has given rise to numerous Directives and, less frequently, other legal instruments specifically devoted to water, for example, the communication on water scarcity (COM 2007b). Legal scholarship tends rather easily to analyze the whole set into three waves of legislation (Grant et al. 2000: 152–76; Krämer 2000; Weale et al. 2000). The first wave corresponds to the Directives adopted in the 1970s and 1980s and lays the foundations of the Community water legal edifice, with a particular focus on industrial pollution. The second wave developed in the 1990s and experimented with adaptations to the previously established legal regime by enlarging its core legal choices to municipalities and agriculture. The third wave, which began with the Water Framework Directive (2000) adopted jointly by the Council and the European Parliament, is much more innovative. Amending or complementing the Water Framework Directive, is 'daughter' Decision no. 2455/2001/EC taken under article 16 of the Water Framework Directive. It sets out a list of priority substances and amends Annex X of the Directive regarding the implementation powers of the European Commission. More recent Directives include the Directive on the assessment and management of flood risks (Directive 2007/60/EC); the European marine

strategy Directive (Directive 2008/56/EC); the new daughter Directive, adopted under article 17 of the Water Framework Directive, on the protection of groundwater against pollution and deterioration (Directive 2006/118/EC); the communication on water scarcity and droughts (COM 2007b); and the proposed daughter Directive on environmental quality standards and pollution control in the field of water policy also amending the Water Framework Directive (COM 2006). There are also the Common Implementation Strategy documents, whose legal classification is not always easy (COM 2007a; Strategic document 2001, 2003, 2004, 2006; Work Programme 2007).

14.2.3 'Administrative' Changes

Community water law is thus dynamic, continuously witnessing powerful developments. Such policy and legal developments have lately been spreading to other areas and, most noticeably, also translated into what may be termed the administrative implementation dimension of Community Water Law. This has been so with the devising and implementation of the Common Implementation Strategy (Bosenius & Holzwarth 2006). The Strategy is a very wide cooperation and coordination effort established by the European Union Member States, Norway, and the European Commission only 5 months after the entry into force of the Water Framework Directive.

The rationale behind the Strategy seems to be threefold: first, acknowledgment that the implementation of the Water Framework Directive raises momentous technical challenges to both the Member States of the European Community and other neighbouring States as well as stakeholders and non-governmental organizations; second, recognition that successful and effective implementation of the Water Framework Directive depends on the design of a common understanding and approach, particularly because many European river basins are international; and third, the widespread experience of non-compliance with previous water directives thus recommending a pathway less premised on formal entitlements but more on concerted cooperative action by a wide universe of actors. The experience with the first and second waves of legislation was that implementation of water law remained a purely Member State competence and, because of this, the endeavour was characterized by an overwhelming degree of outright non-compliance. On the whole, Community Water Policy has been moving, lately with much vigour and momentum, in particular after the adoption in 2000 of the Water Framework Directive.

14.2.4 'Judicial' Changes

Community water policy also materialized in case law. In contrast with many other areas of Community intervention, often marked by the European Court of Justice's powerful activism, in the water law realm jurisprudence seems to have had a more modest impact in terms of innovative normative ideas, concepts, or solutions. Historically, the case law demonstrates the repeated failure of the Member States' to comply with their obligations under that Community water

law (e.g., *Commission vs. Germany* 1996, 1997, 1999, 2002). The only structural predicate which may be attributed to this repeated finding of Community law infringement, mostly by inaction, is that it rendered clear the need to evolve.

The most noticeable exception in this regard is the European Court of Justice's ruling in *Spain v. The Council* (2001). Spain brought an annulment case against the Council for allegedly proceeding on the wrong legal basis in ratifying the Danube Convention (1994). Fearing the interpretation of Community law put forward by Spain, several countries, not Parties to the Convention, intervened. The ruling of the Court overcame the temptation to subjugate the main measures of the Community environmental policy to the unanimity requirement of article 175(2), henceforth clearly conceived as a narrow exception to the general decision-making rule set out in article 175(1), leaving article 175(2) applicable only to water management measures of a purely quantitative nature. This eliminated the prospect of submitting Community water policy to a veto by any Member State having a conservative approach. This more restrictive reading was later translated into 'constitutional form' by the amendment introduced by the Treaty of Nice to the relevant part of article 175(2), thus 'constitutionalizing' the solution found by the Court.

14.3 A Closer Look at the Legislative Change

These numerous changes, particularly at the legislative level, but also, more and more, those at the administrative level, are momentous and deserve closer scrutiny.

14.3.1 The First Wave of Water Legislation

The first wave of legislation may be summarized as having: (a) A fragmentary outlook—giving attention to and protection of some waters only, usually waters of interest for the human use (drinking, bathing, fish production); (b) Shallow environmental substance—the driving force for the policy development was the construction of the internal market and the concern with the comparable terms of competition among the enterprises in meeting the obligations regarding pollution and environmental standards; (c) Dilemmatic instrumental use—the quality problem is unique and mainly polarized by a fight against pollution that is premised either on the usage of emission value limits or on quality standards, with the choices poorly made; (d) Limited subjective scope—mainly industries are targeted; (e) Traditional State-only, powerful, command-and-control approach—the general effectiveness deficit attributed to Community environmental law is worsened by the fact that the 'tiger' on which the policy relies for implementation is, in fact, rather static and even 'toothless'; (f) Disparate legal instruments—the Law is made of disparate instruments, but almost always of a hard law nature.

14.3.2 The Second Wave of Water Legislation

In spite of some progress, this situation did not change fundamentally with the second wave of legislation. Particularly representative in this regard are the Urban Waste Water Treatment Directive (1991), the Nitrates Directive (1991), the new Drinking Water Directive (1998), as well as (insofar as it concerns the water sector) the Directive for Integrated Pollution and Prevention Control (1996). The scope of the waters covered and the sectors of activities subject to this newer discipline were enlarged. Indeed, thenceforth, they equally touch the agricultural and the municipal sectors. Furthermore, a certain sense of time, so necessary in effective water management, began to come to the fore. This is evidenced, for instance, in the consecrating of the prevailing notion of prevention (Directive for Integrated Pollution and Prevention Control 1996). This lends or accentuates a more genuine environmental tone to the Community Water Policy. There is also in the newer legislation sensitivity to the need to integrate waters and actions that naturally are interrelated or have interrelated effects and to adopt a more encompassing treatment of water problems. These positive changes remained, however, of a mere remedial nature; they were changes in a fundamental continuity with disparate but traditional State water management, only superficially imbued with an environmental sensibility.

14.3.3 The Water Framework Directive

The same does not appear true for the Water Framework Directive, a new legal instrument purporting to make a fundamental shift in the way water management is conceived. This shift may be analytically taken as resting on ten main innovative pillars that together build an impressive body of European freshwater law, whose principles may also influence and support the implementation of the specific European Community secondary water law. The Water Framework Directive reinforces, lends coherence and, not least, 'teeth' (through its more effective legal mechanisms and institutions) to this sophisticated previous and ongoing legal construction.

The holistic treatment of all management problems: The newer water policy attempts to deal with the true complex nature of the manifold problems requiring management and attention over time. Management of waters formerly was confined to some particular problems only, quality issues prevailing. With the Water Framework Directive, management becomes much more comprehensive, henceforth embracing both quality and quantity issues (preamble (19), (23), art. 1). It equally starts to include provisions related to extreme events, be they droughts or floods, or accidents (preamble (32), (39), arts. 1 (e), 4(6)). The economic implications of human actions on water are considered (arts. 5, 9) along with the contribution of the public (art. 14). This newer policy aspires to being premised on knowledge and scientific research, data collection, monitoring (preamble (12), (49), arts. 8, 11(5), 16(2), (5), 18, 20).

Integration of the actual complexity of reality/nature: With the neutral, objective, 'natural' notion of river basin (arts. 2(13), (15); compare *Berlin Rules* 2004: art. 5), all waters, be they surface, ground, transitional, or coastal and marine waters (arts. 1(1), (2), (6), (7)), are considered, as well as their ecosystem relations and those with wetlands (art. 1(a)).

(Integrated) river basin management: Water management is referred to the river basin, which works as a geographical management unit (art. 3(1)), corresponding to the real occurring problems and the more environmental friendly solutions and importing the corresponding set up of the competent authorities. With this structural choice, Community water law and management becomes oriented by ecological criteria (arts. 3(2), (3)), instead of relying, as happened in the past, on administrative or political factors and artificial criteria that frequently led to ineffective water management solutions to the issues raised by reality.

Pollution control: Pollution control and other water protection activities are functionally oriented to the 'environmental objectives' and in particular the general target of attaining 'good water status' (arts. 1, 2(18), (20), 4(1)(ii), (2)(ii)), which is ecologically defined and ambitious, ideally in 2015, and exceptionally in 2021 or 2027, derogations being however narrowly defined and tightly subject to stringent and increasingly rigorous conditions to be set out in river basin management plans and programmes of measures (arts. 4(4)–(7)).

The central notion of 'good status' entails a number of objectives in respect of which the quality of water is protected. The key ones at the European level are the general protection of the aquatic ecology, the specific protection of unique and valuable habitats, the protection of drinking water resources, and the protection of bathing water. All these objectives must be integrated for each river basin. The last three—special habitats, drinking water, and bathing water—apply only to specific bodies of water (those supporting special wetlands; those identified for drinking water abstraction; and those generally used as bathing areas). In contrast, ecological protection should apply to all waters: the central requirement of the Treaty is that the environment be protected to a high level in its entirety. For surface water, 'good water status' is a function of both ecological and chemical integrity. Hence, a general requirement for ecological protection, and a general minimum chemical standard, was introduced to cover all surface waters, depending on two further standards: 'good ecological status' and 'good chemical status'.

'Good ecological status' is defined in Annex V of the Directive, in terms of the quality of the biological community, the hydrological characteristics and the chemical characteristics. As no absolute standards for biological quality can be set which apply across the European Community, because of ecological variability, the controls are specified as allowing only a slight departure from the biological community that would be expected in conditions of minimal anthropogenic impact. A set of procedures for identifying that point for a given body of water, and establishing particular chemical or hydromorphological standards to achieve it, is provided, together with a system for ensuring that each Member State interprets the procedure in a consistent way (to ensure comparability). The system is somewhat

complicated, but this is inevitable given the extent of ecological variability and the large number of parameters that must be dealt with.

Chemical protection is defined in terms of compliance with all the quality standards established for chemical substances at European level. The Directive also provides a mechanism for renewing these standards and establishing new ones by means of a prioritization mechanism for hazardous chemicals. This will ensure at least a minimum chemical quality, particularly in relation to toxic substances, everywhere in the Community.

The other uses or objectives for which water is protected apply in specific areas, not everywhere. Therefore, the obvious way to incorporate them is to designate specific protection zones within the river basin which must meet these different objectives. The overall plan of objectives for the river basin will then require ecological and chemical protection everywhere as a minimum, but where more stringent requirements are needed for particular uses, zones will be established and higher objectives set within them.

One other category of uses does not fit this picture: the set of uses that adversely affect the status of water but which are considered essential on their own terms. They are overriding policy objectives. The key examples are flood protection (art. 1(e)) and essential drinking water supply (art. 7). The problem is dealt with by providing derogations from the requirement to achieve good status for these cases, so long as all appropriate mitigation measures are taken (arts. 4(4), (6)). Less clear-cut cases are navigation and power generation, where the activity is open to alternative approaches (transport can be switched to land; other means of power generation can be used). Derogations are provided for those cases also, but subject to three tests: that the alternatives are technically impossible, that they are prohibitively expensive, or that they produce a worse overall environmental result (art. 4(7)).

For groundwater, its 'good status' depends of the chemical status and the quantitative withdrawals. The case of groundwater is somewhat different than surface waters. The presumption in relation to groundwater should broadly be that it should not be polluted at all. For this reason, setting chemical quality standards may not be the best approach, as it gives the impression of an allowed level of pollution. A very few such standards have been established at the European level for particular problems (nitrates, pesticides and biocides), and these must always be adhered to. But for general protection, another approach has been taken. It is essentially a precautionary one. It comprises a prohibition on direct discharges to groundwater (art. 4(b)(i)), and (to cover indirect discharges) a requirement to monitor groundwater bodies so as to detect changes in chemical composition and to reverse any anthropogenically induced upwards pollution trend (art. 8(1)).

Taken together, these should ensure the protection of groundwater from all contamination, according to the principle of minimum anthropogenic impact. Quantity is also a major issue for groundwater. Briefly, the issue can be put as follows. There is only a certain amount of recharge into groundwater each year, and of this recharge, some is needed to support connected ecosystems (whether they be surface water bodies or terrestrial systems such as wetlands). For good manage-

ment, only that portion of the overall recharge not needed by the ecology can be abstracted—this is the sustainable resource, and the Directive limits abstraction to that quantity. One of the innovations of the Directive is its provision of a framework for integrated management of groundwater and surface water for the first time at the European level.

A combined approach: If dramatic results are to be obtained in the control of pollution, the whole repertoire of instruments must be jointly used; there is no more room left for the traditional disjunctive approach of resorting either to emission limit values or to quality objectives, but instead a combined approach (art.10) becomes mandatory.

Planning: Planning plays a crucial role in the pursuance of the new policy (Ell 2003). The river basin management plan foreseen (art. 13) is a detailed account of how the objectives set for the river basin (ecological status, quantitative status, chemical status, and protected area objectives) are to be reached within the timescale required. The management plan must set out all the elements of the analysis performed, including the river basin's characteristics, a review of the impact of human activity, estimation of the effect of existing legislation, and the remaining 'gap' in meeting these objectives and a set of measures designed to fill the gap (art. 5). The plan must include an economic analysis of water uses within the river basin to enable rational discussion on the cost-effectiveness of the various possible measures. Behind this conception, there is a more modest understanding of the capacities of the traditional actors involved in the process (the States), and on the other hand, acknowledgement of a need to apprehend and obtain the knowledge of a much wider universe of stakeholders and general information about the river related situations. There is also comprehension of the cyclical nature of such endeavours or needs (art. 13(7)). Effective water policy and management aimed at obtaining good status for European water bodies demands many contributions to devise the right route and many adaptations to the long-term route defined. For that, large participation of the public and stakeholders is granted (art. 14).

Recovery of costs: Before adoption of the Water Framework Directive, while households and main industries were generally paying for their water services, other big consumers or polluters of water, like agriculture, contributed very little. Water services for energy production (cooling water or hydropower), business (flood control), and navigation (river deepening and straightening) rarely pay the full cost of those services, let alone the damage to the environment. To counter this and the fact that the principle of charging for water services is not uniformly practiced throughout Europe, the Directive foresees that water is henceforth to be priced and the prices have to be sound, corresponding to the true costs of the services provided in the provision of water, in wastewater treatment and discharge, and in environmental services (art. 9; Annex III). One senses that this shall open the door, without declaring so, to other solutions in terms of management of the traditional natural monopoly of water—liberalization, privatization, and public-private partnerships. The market and market incentives have to be mobilized to work for the protection of the aquatic environment; adequate water pricing is expected to act as an incentive for the sustainable use of water resources and thus as decisive help to achieve the environmental

objectives under the Directive. It is, however, less clear how this demanding innovative policy harmonizes with the guideline set by the last sentence of article 9(1) ('Member States may in so doing have regard to the social, … and economic effects of the recovery …') as well as with the implication of paragraph 1 of the Preamble, which proclaims that 'Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such'.

Participation of the public: In attempting to get European waters clean, the role of citizens and citizens' groups is deemed crucial. There are three main reasons for the emphasis on public participation. The first is that the (hard) decisions on the most appropriate measures to achieve the objectives in the river basin management plan will involve balancing the interests of various groups over time (intra and possibly also intergenerational equity). The economic analysis requirement is intended to provide a rational basis for these deliberative endeavours, but it is essential that the process is open to the scrutiny of those who will be affected. The second reason concerns enforceability. The greater the transparency in the establishment of objectives, the imposition of measures, and the reporting of standards, the greater the care Member States will take to implement the legislation in good faith, and the greater the power of the citizens to influence the direction of environmental protection, whether through consultation or, if disagreement persists, through the complaints procedures and the courts. Caring for Europe's waters will require more involvement of citizens, interested parties, and non-governmental organizations. To that end, the Water Framework Directive which was already approved through a wide consultation of the public (Canelas de Castro 1998), requires information and consultation when river basin management plans are established: the river basin management plan must be issued in draft, and the background documentation on which the decisions are based must be made accessible (art. 14(1)). Furthermore, a biannual conference in order to provide for a regular exchange of views and experiences in implementation will be organized. Too often in the past, implementation has been left unexamined until it was too late—until Member States were already woefully behind schedule and out of compliance. The Water Framework Directive, by establishing very early on a network for the exchange of information and experience between water professionals throughout the Community seeks to ensure that this does not happen. The third reason partially related to the former one, is knowledge, or better yet, lack of knowledge. The new European policy acknowledges information knowledge gaps and tries to overcome them, not least by widely enlarging the basis of knowledge sources and gaining, in particular, epistemic communities. These solutions are in line and anticipate the legal empowerments foreseen by the UNECE Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (1998). Effectiveness and legitimacy are two powerful drivers of this newer construction, one of a more human face, one of a less technocratic nature.

Coherence, streamlining: The Water Framework Directive purports to streamline and rationalize the Community's water legislation by replacing seven of the first wave directives (art. 22): those on surface water, two instruments on measurement methods and sampling frequencies and exchanges of information on fresh water

quality; the fish water, shellfish water, and groundwater directives; and the directive on dangerous substances discharges. The operative provisions of these directives will be taken over in the Directive, allowing them to be repealed. Furthermore, and this owes to its framework character, the Directive aims at becoming an umbrella for all water-related European legislation, namely, the new Community legislation in the fields of flood protection, groundwater protection and priority, hazardous substances.

Internationalization, Europeanization: Most European rivers and lakes are shared internationally. Sometimes they are shared by countries other than Member States of the European Union. It is therefore equally crucial that the normative programme of the Water Framework Directive promotes cooperation and coordination among the main actors involved in this international scene to ensure the application of the substantive regime. This requires the establishment of international river basin districts, ensuring the appropriate administrative arrangements and assigning those basin districts to competent authorities (arts. 3(3), (4)) as well as, if possible, adopting joint river basin plans (art. 13(2)) or coordinating programmes of measures (art. 3(4)), if need be through the mediation of the Commission, including basin States that are not Members of the European Union (arts. 3(5), 13(3)). But this is reflected equally in the attention to international experiences of value, which the European Union is well advised to look at, and possibly follow (art. 3(4)). In this as well, the Water Framework Directive reveals a commendable attention to a goal of normative coherence or consistency and it inscribes itself as a normative link with a definite regional outlook in a patchy network of legal documents in the European setting, equally noticeable in the Helsinki Watercourses Convention and other Economic Commission of Europe conventions and protocols (Aarhus Convention 1998; Espoo Convention 1991; Helsinki Convention on Industrial Accidents 1992; Kiev Protocol on Civil Liability 2003; Kiev Protocol on Pollutant Release and Transfer Registers 2003; Kiev Protocol on Strategic Environmental Impact Assessment 2003; London Protocol on Water and Health 1999), as well as several sub-regional model conventions, such as the Danube Convention (1994; Bogdanovic 2005), and the Luso-Spanish Convention (1998; Canelas de Castro 2003, 2005, 2006b).

14.4 Changes in Implementation

A common conceptual denominator seems to be behind the newer water policy—integration, a holistic outlook. Indeed, the new policy demands integration in several regards: integration of goals (protection and sustainable use), integration of waters, integration of pollution prevention and control techniques, integration of administrations and other actors, integration of subject-matters ('normal' management, but also management of extreme events), integration of policies, even integration of times, by asking for long term and cyclical planning and by lending prominent attention to not only the question or time of rule-setting,

but also the question or time of implementation. Regarding implementation, other important innovations are detectable, at both the level of processes and structures and regarding the actors involved. The innovations defy classification, but seem to establish new forms of governance in the water sector, again contributing to an overall impression of sea change.

14.4.1 A Shared Innovative Process

Such an ambitiously integrative newer water regime naturally sets a momentous challenge. Indeed, the numerous, but also profound shifts at the legislative level are already impacting implementation, starting with the entrance into force of the Water Framework Directive. The resulting process actually is less than halfway through the most demanding challenge of ensuring good status of the European Union waters by 2015, and, for the most difficult cases, by 2021 or 2027. The first momentous change connected with the implementation process is that it is occurring in the context of a Common Implementation Strategy that was agreed upon in May 2001, devised and in the process of being carried out jointly by the European Commission and the Member States, and sometimes by representatives of civil societies. This is innovative, firstly, because implementation is formally an exclusive competence of the Member States, yet they, acknowledging the complexities of the discipline as well as the difficulties implementation may entail, but, urged by the European Commission, decided not to repeat the past record of non-compliance, opened themselves to a coordinated venture by complying with a dynamically updated Strategy that is, moreover, joined by many other actors in the shared endeavour.

14.4.2 A Multilayered, Participatory, Complex Structure

Implementation also, in the equally innovative complex structure devised, ensures the contribution by multiple and multilayered actors. Centred on the implementation of the Water Framework Directive and according to it, the Common Implementation Strategy is designed as an informal forum for 'open cooperation' and information sharing. This cooperative mode operates through a multi-level threefold organizational structure: (a) Working groups, charged with technical consultation and conceiving non-binding guidance documents; (b) A strategic coordination group, chaired by the European Commission along with Member State representatives, responsible for receiving the working groups outputs and advising the water directors; and (c) The water directors' meetings, twice a year, co-chaired by the European Commission and the Council Presidency and steering the whole implementation process.

Expression of the underlying working philosophy as well as the dynamic nature of the process, this structure has already known several adaptations in the reorganization

of the format and tasks of some of the organizational components, according to the evolving work plans and priorities of the moment. These modifications, which left the basic profile globally untouched, demonstrate a commendable learning capacity. In parallel to this more 'bureaucratic' structure, but also maintaining an interactive dialogue therewith and modelled on the Common Implementation Strategy working groups, there is a multi-stakeholder advisory forum joined by representatives from non-governmental organizations, industry associations, and outside experts along with national representatives and the European Commission. They are equally charged with reflecting on the whole implementation endeavour with a view to new policy development. Some of these forums have been transformed into formal Strategy working groups in an attempt to achieve a better and more effective integration of goals and outcomes.

14.4.3 Parallels and Dissimilarities with Other Processes

The features of such process remind us of the open method of coordination, as it is normally carried out in the realm of the Community Employment Strategy or the Community Social Policy. Similar to these processes, policy development and implementation in the Common Implementation Strategy process draw on targets. The Strategy is equally premised on a substantial operational fuzziness as well as lack or insufficiency of some information. This underscores the need for obtaining indicators and identifying benchmarks and best practices, and on that basis drawing scoreboards through peer-review and adopting non-binding guidelines and strategies in a participatory process targeting the delivery of better public policy outcomes. Finally, in another telling parallel, relating to the outputs of the process, these are normally translated into soft law instruments. But, as also occurs in some instances of the open method of coordination, examples may be found of these results subsequently entering into interaction with the legislative level.

Beyond these similarities, there are striking differences. In particular, contrary to the Employment and Social Policies, water policy is premised on a strong, clear-cut legal competence and legal basis for decision-making, typically through hard law instruments. Resort to an open method of coordination is therefore, in the Community water realm, and contrary to the employment or social ones, less natural, a 'necessity' merely deriving *ex post* from a certain reading of facts, more so than of law and its normative formal requirements. This, however, also indicates that the resort to this form of new governance is conceived not so much as an alternative or a default to a traditional form of governance, but rather as a complement thereto (de Búrca & Scott 2006). It relates to the main legislative competence level not in a disjunctive tension, but rather in a mutually cooperative and mutually reinforcing way. The outcomes of the procedure may subsequently be 'fed' into the hard law making process, through a more traditional system, by resort to the article 21 committee, a committee structure and procedure established by the said provision of the Water Framework Directive.

14.4.4 A Functionally-Oriented, Iterative Learning Process

Possibly even more innovative than the fact that States (including non-Member States) opened themselves up to other contributions and inputs is the process of implementation, even if through a soft coordination/law mode, and the structure created. This results from the premises of and the actual dynamic 'game' or interplay amongst these actors. In order to comprehend them, it may be important, first, to grasp that, for all the new indicators and the solid representation of the building blocks of this new Community water policy, for all the normative promises involved in the functional commitment to environmental objectives and, even more specifically, the target of good water status, for all the clarity in passing the normative idea that several instruments have to be used (plans and programmes of measures, combined approach, economic instruments), the text of the Water Framework Directive does not provide all the answers. On the contrary, it sometimes rather hides what may be seen as an operational gap. Indeed, there are many undetermined concepts, just as there is, equally, much indeterminacy as to the pathways to be followed and instruments to be used to pursue the goals assigned. Above all, the Directive implicitly acknowledges and tries to resolve a structural problem: there is a significant lack of knowledge and information that is crucial for effective discharge of the obligations imparted and goals assigned. The Directive recognizes that this information, to be obtained at different stages in the demanding process of implementation, is to be fed back into the process itself, if it is to deliver on its goals. The implementation process, to be successful, has to be conceived as an iterative learning process, to a significant extent an open-ended one, in spite of being, almost paradoxically, a functionally-oriented one. One of the lessons of the Member States opening themselves to other actors and interacting with them, in spite of their formally warranted exclusive competence of implementation, is precisely the need to learn with and from others, namely with and from individuals or (epistemic) communities closer to the actual problems and holding particularly relevant information for the good, rational, sound deliberation and implementation of the Water Framework Directive that is sought.

14.5 Final Remarks

Taken together, the legislative and administrative or implementation developments, since the implementation process is conceived as an eminently learning, dynamic process, reveal four structural options encapsulating values, axiological choices, and teleological choices. These changes materialize in particular in the following cardinal options (Canelas de Castro 2000, 2005, 2006a): a more environment-friendly option; a more economy-friendly option; a more inclusive-relationship-friendly option; more coherence but also a more diversified legal-system-friendly option. In this, the water policy appears as a policy axiologically and teleologically inspired, a policy and a law with an *ethos* and a *telos*, not merely

a technocratic 'magic' formula immune to its philosophical, political, and social context and the choices these entail. Beyond that, we may equally recognize some of the key features of sustainable development. These momentous changes are tantamount to a profound revolution in water management, a true paradigm shift. The shift was from fragmentary solutions applicable to certain types of water and to certain human activities to a new Community water policy evolving towards a holistic project, in search of sustainable management, and, with it, the satisfaction of European citizens' hopes for the fundamental quality of their waters.

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Chapter 15
Southern Africa: Evolving Regional Water Law and Politics

Pieter van der Zaag

Abstract This chapter considers the governance of transboundary water resources in southern Africa. The emerging regional water law as well as trends in water sector reforms are described, illustrating the interplay of persisting customary practices, the inherited colonial law, and post-colonial legal reforms. The establishment of the Southern African Development Community is a landmark development that created an enabling environment for transboundary water cooperation to flourish. The development of regional water law in the Community's Protocol on Shared Watercourses is described in some detail. Experiments with basin-wide and catchment-specific institutional innovations are assessed, whereby national water sector reforms are linked to the establishment of river basin organizations. The chapter ends with a discussion on key aspects of transboundary river basin management, namely the interplay between institutions and hydraulic infrastructure, stakeholder involvement, environmental flows, interbasin transfers, and the monitoring of agreements.

Keywords Conflict • cooperation • environmental flows • interbasin transfers • river basin organization

15.1 Introduction

This chapter deals with the twelve mainland countries of southern Africa that are members of the Southern African Development Community (SADC): Angola, Botswana, the Democratic Republic of the Congo, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. Water resources in southern Africa are scarce and unevenly distributed in time and space. Most areas regularly experience severe droughts and occasionally also damaging floods. Most countries, and especially Mozambique, South Africa, Namibia and

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Botswana, rely on water resources that were generated outside their own territories. Most water resources are found towards the north, while most people and industrial development are found in the arid south, particularly in South Africa. South Africa increasingly relies on complex interbasin transfer schemes to satisfy the water demands of its growing economy. Most of these waters are transboundary and shared with neighbouring states. There are 16 watercourses located in two or more countries (see Table 15.1), ranging from fairly small river systems such as the Buzi and the Cuvelai, to the large Zambezi and Nile river basins.

There are also large regional variations in economic development (Salman 2004). There is a surprising inverse relationship between water availability and economic development. About 70% of the water used is for irrigation (Pallett 1997). Some rivers are fully committed and are considered closed to additional water uses. Yet, the availability of sufficient water is a prerequisite for economic growth; development options are closely tied to the availability of water (Böge 2006). In South Africa, Namibia, and Botswana, water is already a constraint to further economic growth.

Many river basins here are shared by more than one country. Because water does not respect political boundaries, and because interventions in upstream areas impact downstream while claims to water of downstream countries may constrain upstream use, riparian countries must coordinate their activities. The southern African countries have a history of cooperation on water and other political and economic fields. This notwithstanding, Wolf et al. (2003) have identified several

Table 15.1 Transboundary watercourses in southern Africa (Modified from Pallett 1997; Savenije & Van der Zaag 2000; Heyns 2003; Eberhardt 2003; Böge 2006; Transboundary Freshwater Dispute Database 2008)

Watercourse	Catchment (1,000 km^2)	Riparian countries (in square brackets riparian countries often not considered; in italics countries outside the region)
Buzi	28	Mozambique, Zimbabwe
Congo	3,800	Angola, *Burundi*, *Cameroon*, *Central African Republic*, DR Congo, *Gabon*, *Rwanda*, Tanzania, *Uganda*, Zambia
Cunene	110	Angola, Namibia
Cuvelai	100	Angola, Namibia
Incomati	47	Mozambique, South Africa, Swaziland
Lake Chilwa	8	Malawi, Mozambique
Limpopo	413	Botswana, Mozambique, South Africa, Zimbabwe
Maputo	30	Mozambique, South Africa, Swaziland
Nile	2,800	*Burundi*, DR Congo, *Egypt*, *Eritrea*, *Ethiopia*, *Kenya*, *Rwanda*, *Sudan*, Tanzania, *Uganda*
Okavango	530	Angola, Botswana, Namibia [Zimbabwe]
Orange–Senqu	850	Botswana, Lesotho, Namibia, South Africa
Pungwe	31	Mozambique, Zimbabwe
Rovuma	155	Malawi, Mozambique, Tanzania
Save	93	Mozambique, Zimbabwe
Umbeluzi	6	Mozambique, Swaziland [South Africa]
Zambezi	1,400	Angola, Botswana, Malawi, Namibia, Mozambique, Tanzania, Zambia, Zimbabwe [DR Congo]

major transboundary watercourses in southern Africa as 'basins at risk', namely the Cunene, Incomati, Limpopo, Okavango, Orange, and Zambezi.

This chapter examines the evolution of transboundary water governance, focusing also on the interplay of persisting customary practices, inherited colonial law, and post-colonial legal reforms. The gradual increase in water withdrawals over time forced legal arrangements to widen their spatial reach. After briefly reviewing the pre-colonial and colonial experience, some cases of tension and cooperation during the post-colonial period are identified, followed by a discussion of the Southern African Development Community and its contribution to transboundary water cooperation. The subsequent section deals with the challenge to implement lofty paper agreements. This chapter ends with a discussion of a handful of key aspects of transboundary river basin management that are of particular importance, including the interplay between institutions and hydraulic infrastructure, stakeholder involvement, environmental flows, interbasin transfers, and the monitoring of agreements.

15.2 From Customary Law to Colonial Treaties

In southern Africa, as elsewhere, current arrangements regulating access to water and water use have been shaped by historical developments. In many places water sharing arrangements evolved that were firmly embedded in the local culture and that reflect core values of communities, their knowledge and understanding of the physical environment and how they related to it. Local level water management practices were therefore consistent with, and a constituent part of, customary principles (Cory & Hartnoll 1945; Cory 1953; Kidd, this book; Ramazzotti 1996; Schapera 1943; Van der Zaag 2005b). Customary practices related to the management of natural resources are often considered 'local' or 'localized'. Yet many similarities across southern Africa exist, reflecting the historical pathways of the various peoples of the region. The large expansion southward of the Bantu-speaking people in the first millennium was followed by a 'bounce-back' trek northward during the nineteenth century. Hence not only linguistic and cultural links exist across large distances, such as between the Sotho and the Tswana, but also values and customary practices are shared. Throughout the region water was, and in many places continues to be, considered god-given and thus cannot be denied to anyone, nor privatized. The source of freshwater, rainfall, is revered nearly everywhere and rain priests are important indigenous institutions still found in many places. Rainfall is constraining element in (rainfed) food production and an important risk factor, particularly respecting the choice of the best planting dates. Concepts such as fairness and 'giving each other chances' signified a strong notion of equity if not solidarity. Taboos often reflected respect for the environment and frequently dealt with protecting water sources against pollution (Van der Zaag 1999). Customary principles often also respected prior investments in water infrastructure, and thus reflected a notion of hydraulic property (Coward 1986).

Colonies in Africa frequently used rivers as borders, dividing people who had hitherto been one (Böge 2006; Swatuk & Vale 1999). New legal principles were

imported by the colonizer and imposed (Van der Zaag 2007) leading to new legal systems that nearly always ignored local traditions. These systems therefore often differed between neighbouring countries (e.g., Mozambique and South Africa). South Africa inherited the riparian rights doctrine developed in Britain, but Rhodesia (now Zimbabwe) rejected this system in 1913 and adopted the prior appropriation doctrine developed in the western parts of the United States (McIlwaine 1936). In 1998, both countries, however, replaced their inherited water rights systems with new legal systems based on public management (National Water Act 1998; Water Act 1998).

Given the semi-arid nature of the climate and the general scarcity of water in southern Africa, with an increase in water withdrawals and water pollution, mainly from mining operations, the impacts of water use became apparent at increasing spatial scales. This gave rise to formal treaties between European countries aimed at protecting their interests in their African colonies (Table 15.2). Other agreements were triggered by the construction of large hydraulic infrastructural

Table 15.2 Water (related) treaties in southern Africa (1926–1969)

Year	River	Treaty
1926	Cunene	Agreement between the Government of the Republic of South Africa and the Government of Portugal in regard to the first phase of development of the water resources of the Kunene River Basin[a]
1937	Rovuma	Exchange of notes constituting an agreement between the United Kingdom and Portugal regarding the boundary between Tanganyika Territory and Mozambique[b]
1953	Zambezi	Exchange of notes constituting an agreement between Her Majesty's government in the United Kingdom of Great Britain and northern Ireland and the Portuguese government providing for the Portuguese participation in the Shire Valley Project[b]
1954	Zambezi	Agreement between the government of the United Kingdom of Great Britain and Northern Ireland on their behalf and on behalf of the government of the Federation of Rhodesia and Nyasaland and the government of Portugal with regard to certain Angolan and northern Rhodesian natives living on the Kwando river[b]
1963	Zambezi	Agreement creating to the Central African Power Corporation[b]
1964	Cunene, Cuvelai, Limpopo, Incomati, Maputo	Bipartite Agreement between the government of the Republic of South Africa and the government of Portugal in regard to rivers of mutual interest and the Cunene River Scheme[c]
1967	Zambezi	Agreement between South Africa and Portugal relating to hydropower development on the Zambezi River[b]
1969	Cunene	Agreement between the government of the Republic of South Africa and the government of Portugal in regard to the first phase of development of the water resource of the Cunene River Basin[b]

[a]Food and Agriculture Organisation 2008
[b]Transboundary Freshwater Dispute Database 2008
[c]Carmo Vaz & Van der Zaag 2003: Annex 4.

works on international rivers. The prime example is the Kariba dam on the Zambezi, completed in 1959 to provide the copper mines in Northern Rhodesia (now Zambia) with sufficient energy, creating Africa's largest man-made reservoir (180×10^9 m^3). Since only three countries (Britain, Portugal, Germany) colonized the southern African countries, one treaty could bear on more than one river in different colonies, as was the case of the agreement of 1964 concluded between Portugal and South Africa (Carmo Vaz & Van der Zaag 2003).

15.3 The Post-Colonial Period

Decolonization started in 1960, and was a quick process for some countries and more protracted for others. By 1980 all mainland countries had attained independence, except Namibia (which became independent in 1990). This political context provided new opportunities and impetus for coordinated transboundary water management. The struggle for political independence and economic growth, and against apartheid, formed a common unifying factor that today still cushions tensions and ensures that they do not escalate into open conflict. Over the last 25 years water tensions have existed between countries. Here the following eight cases are highlighted:

1. Between Namibia and Botswana (1990s; resolved): ownership of Sedudu/Kasikili island in the Chobe river, part of the Zambezi watercourse (Ashton 2000; Böge 2006; Salman 2004).
2. Between South Africa and Mozambique (1990s; resolved): minimum cross-border flow of the Incomati at Komatipoort/Ressano Garcia (Carmo Vaz & Lopes Pereiera 2000; Van der Zaag & Carmo Vaz 2003).
3. Between Zimbabwe and Mozambique (1990s; resolved): abstraction of Pungwe water to secure the water supply of the city of Mutare, an interbasin transfer (Gumbo & Van der Zaag 2002).
4. Between Lesotho and South Africa (1998; resolved): South African troops protected the Katse dam inside Lesotho during political instability in order to secure uninterrupted supply to Gauteng (Böge 2006).
5. Between Tanzania and Malawi (since 1970s, ongoing): border dispute over the exact border across Lake Malawi/Nyasa (Salman 2004).
6. Between Namibia and South Africa (since 1990, ongoing): border dispute on the Lower Orange (Salman 2004; Böge 2006).
7. Between Namibia and Botswana (since 1995, ongoing): planned abstraction of Okavango water to secure the water supply of the city of Windhoek, an interbasin transfer (Ashton 2000; Salman 2004).
8. Between Zambia and Zimbabwe (since 1998, ongoing): Zimbabwe wishes to construct Batoka Gorge hydropower dam on the Zambezi river together with Zambia, but Zambia does not want to join.

All eight cases concern bilateral tensions, of which half have been resolved amicably; in the others, the problems are being considered at appropriate bilateral

and regional forums. Numbers 1, 5 and 6 are border disputes, not directly related to water, although number 6 has implications for access to irrigation water for Namibian farmers. Number 8 concerns a country that depends on co-financing of the intended hydropower development by the other riparian state. The other four cases are all directly or indirectly related to securing the water requirements of large cities and their economies. This is very clear in number 4, the only case that involved physical violence—the insertion of South African troops to protect the Katse dam, part of the Lesotho Highlands Water Project, whereby 17 people were killed. This incident was triggered by a larger power struggle within Lesotho that was unrelated to water. Numbers 2 and 3 have been resolved by signed agreements, and number 7 is not yet resolved. Clearly, southern Africa has the diplomatic capacity and political will to manage these tensions and to ensure that they do not escalate further.

Apart from past tensions, there are a number of 'potential hydro-political hotspots' involving large engineering interventions, either interbasin transfer schemes (further development of the Lesotho Highlands Water Project on the Orange, interbasin transfers from the Congo to the Zambezi and from the Zambezi to Bulawayo and Gauteng), or reservoirs (Epupa on the Cunene; Divundu on the Okavango, and Mpanda Uncua/Mphanda Nkuwa on the Zambezi) (Heyns 2003). International non-state actors (engineering companies and environmental organizations) from outside the region play a role in some, if not all, of these projects, potentially complicating matters.

15.3.1 Establishment of the Southern African Development Community

Southern African countries, acutely aware of their common history, in 1980 formed a loose alliance of nine majority-ruled states, known as the Southern African Development Coordination Conference, aimed at coordinating development projects in order to lessen economic dependence on apartheid South Africa. In 1992, this organization was transformed when the Southern African Development Community Treaty was signed by the Heads of State and Government of Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe. Namibia acceded to the Community in 1990, South Africa in 1994, and the Democratic Republic of the Congo in 1998. The island states of Mauritius and Madagascar are also members, whereas Seychelles who joined the Community in 1998 withdrew in 2004 when it realized that the cost of membership exceeded the benefits it reaped.

The Community's Treaty aims to achieve development and economic growth, alleviate poverty, enhance the standard and quality of life of the people of southern Africa, and support the socially disadvantaged through regional integration. Other objectives are to achieve the sustainable use of natural resources and effective protection of the environment, and to strengthen and consolidate the long standing historical, social, and cultural affinities and links among the people of the region (Southern African Development Community 2008). Subsequent protocols were adopted, including one in 1995 on shared watercourses. The Community's

Secretariat is in Gaborone, Botswana. The Secretariat has various Directorates. The Water Division falls under the Infrastructure and Services Directorate and is charged with implementing and enforcing the water protocol, the Regional Strategic Action Plan for Integrated Water Resources Development and Management, and the Regional Water Policy adopted in 2006.

The Southern African Development Community, established in 1992, experienced the greatest drought in living memory in that year, with enormous social and economic consequences. In 2000, the worst floods ever experienced. While water can be a threat, it is also the source of prosperity: most electricity and much industrial manufacturing as well as agricultural production are water dependent. This realization led to a proliferation of water treaties since the 1980s (Table 15.3). The most important of these is the regional water protocol to be discussed in the next section.

Table 15.3 Water (related) treaties in southern Africa (1983–2003)

Year	River	Treaty
1983	Incomati and Maputo	Agreement between the Government of the Republic of South Africa, the Government of the Kingdom of Swaziland and the Government of the People's Republic of Mozambique relative to the establishment of a Tripartite Permanent Technical Committee[a]
1984	Zambezi	Agreement between the governments of the Republic of Portugal, the People's Republic of Mozambique and the Republic of South Africa relative to the Cahora Bassa Project[b]
1986	Orange	Treaty on the Lesotho Highlands Water Project between the Government of the Kingdom of Lesotho and the Government of the Republic of South Africa[a]
1987	Zambezi	Agreement on the action plan for the environmentally sound management of the Common Zambezi River System[a]
1987	Zambezi	Agreement between the Republic of Zimbabwe and the Republic of Zambia concerning the utilization of the Zambezi river[a]
1992	Incomati	Treaty on development and utilization of the water resources of the Komati River Basin between the Kingdom of Swaziland and the Government of the Republic of South Africa[a]
1992	Orange	Agreement between the Government of the Republic of Namibia and the Government of the Republic of South Africa on the establishment of a permanent Water Commission[a]
1994	Okavango	Agreement between the Governments of Angola, the Republic of Botswana and the Republic of Namibia on the establishment of a Permanent Okavango River Basin Water Commission (OKACOM)[a]
1995	SADC	Protocol on Shared Watercourse Systems in the Southern African Development Community (SADC) Region[a]
2000	SADC	Revised Protocol on Shared Watercourse Systems in the Southern African Development Community (SADC)[a]
2002	Incomati and Maputo	Tripartite Interim Agreement Between the Republic of Mozambique and the Republic of South Africa and the Kingdom of Swaziland for Co-Operation on the Protection and Sustainable Utilization of the Water Resources of the Incomati and Maputo Watercourses[a]
2003	Congo	Convention on the Sustainable Management of Lake Tanganyika[a]

[a]Food and Agriculture Organisation 2008

[b]Transboundary Freshwater Dispute Database 2008

15.3.2 The Southern African Development Community Protocol on Shared Watercourses

Southern Africa's involvement in developing a regional water law since the early 1990s is closely related to developments in international water law. The Protocol on Shared Watercourse Systems in the Southern African Development Community Region (Southern African Development Community 1995) developed from the Zambezi River Action Plan launched in 1987 (Nakayama 1999). This project slowly developed into the Protocol adopted in 1995 when all but one (Angola) of the 11 heads of state signed it (Ohlsson 1995). The Protocol entered into force in 1998, but Mozambique refused to ratify it because it wanted the concepts of 'drainage basin' and 'watercourse system' to be clarified. Carmo Vaz and Lopes Pereira (2000: 101–102) formulated the point thusly: 'There is a certain tendency among the countries that are located along the upstream reaches of an international river basin to treat the basins of the tributaries as not being part of the basin. In this perspective, for example, the water developments in the Kafue basin would be a matter of planning and decision solely for Zambia, although it is a sub-basin of the Zambezi river basin. Mozambique has always considered this position to be unacceptable and it is one of the reasons why the Government of Mozambique asked for modifications of the SADC Protocol on Shared River Basins.' Mozambique's concerns were informed by its experience, among other matters, in the Incomati, where South Africa and Swaziland were signing treaties on the Komati Basin without involving Mozambique (Van der Zaag & Carmo Vaz 2003).

Although Mozambique's concerns could have been ignored, the United Nations approval of the Convention on the Law of the Non-Navigational Uses of International Watercourses in 1997 exposed the fact that the definitions in the two agreements were not consistent, even though seven (Angola, Botswana, Malawi, Mozambique, Namibia, South Africa, and Zambia) states had voted in favour of the UN Convention. One country abstained (Tanzania), while three (Lesotho, Swaziland, and Zimbabwe) did not vote. Given this situation, the Community revised the Protocol to make it consistent with the UN Convention and acceptable to Mozambique. It was signed by 13 of the now 14 member states in Windhoek in August 2000 (Democratic Congo signed it on a later date). The revised Protocol entered into force in September 2003.

This Protocol on Shared Watercourses in the Southern African Development Community has 16 articles (Southern African Development Community 2000). The preamble refers to the Helsinki Rules (International Law Association 1966) and the UN Watercourses Convention (1997). Article 1 defines key concepts, including 'watercourse,' which replaces the concepts of 'watercourse system' and 'drainage basin' used in the 1995 Protocol. The Protocol aims to foster closer cooperation for judicious, sustainable, and coordinated management, protection, and utilization of shared watercourses and advancement of the Community agenda of regional integration and poverty alleviation. It also promotes shared watercourse agreements and management institutions; sustainable, equitable and reasonable utilization

of the shared watercourses; coordinated and integrated environmentally sound development and management of shared watercourses; harmonization and monitoring of legislation and policies for planning, development, conservation, protection of shared watercourses, and allocation of the resources thereof; and research and technology development, information exchange, capacity building, and the application of appropriate technologies in shared watercourses management (art. 2).

Article 3 defines the general principles, which include: The unity and coherence of each shared watercourse; Utilization of shared watercourses will be open to each Watercourse State; Respect of the existing rules of customary or general international; Maintaining a proper balance between resource development and conservation of the environment; Cooperation with regard to the study and execution of all projects likely to impact on the regime of the shared watercourse; Exchange of available information and hydrological, hydrogeological, water quality, meteorological, and environmental data; Utilization by each State, within its own territory, of a shared watercourse in an equitable and reasonable manner; and in utilizing a shared watercourse in their territories, each State will take all appropriate measures to prevent the causing of significant harm to other Watercourse States. Article 4 covers planned measures and the requirement to notify other watercourse states, environmental protection and preservation, management of shared watercourses, prevention and mitigation of harmful conditions, and emergency situations. Article 5 defines the implementing mechanisms that are the Community Water Sector Organs (Committee of Water Ministers; Committee of Water Senior Officials; Water Sector Coordinating Unit; Water Resources Technical Committee and sub-Committees) and the Shared Watercourse Institutions (watercourse commissions, water authorities or boards, established by the Watercourse States).

The Protocol respects existing agreements on shared watercourses and encourages member countries to establish shared watercourse institutions (art. 6). It provides for the amicable settlement of disputes, or, when disputes cannot be resolved in this way, referring them to the Community's Tribunal for decision (art. 7). The remaining nine articles deal with procedural matters (signature, ratification, entry into force, accession, amendment, withdrawal, termination, depositary, and repeal of the old protocol).

There are many commonalities between the Protocol and the UN Convention. Apart from the common definition of 'watercourse', the right to equitable and reasonable utilization (Protocol: art. 3(7a), (7b); UN Convention: art. 5), the factors to be taken into account to determine what is equitable and reasonable (Protocol: art. 3(8a); UN Convention: art. 6), and the obligation not to cause significant harm (Protocol: art. 3(10a), (10b); UN Convention: art. 7), are identical. The Southern African Development Community is unique as the only region in the world where the UN Watercourses Convention is in force—through the revised Protocol.

There are, however, differences between the Protocol and the UN Convention. The UN Convention focuses on *international* watercourses, while the Community Protocol focuses on *shared* watercourses. Since the definition of watercourse in both is identical, the only difference that could possibly be inferred is that the Community does not hesitate to use a word that has a normative connotation. Second, while the

UN Convention's dispute resolution provisions include negotiations, good offices, mediation, conciliation, etc., the Community Protocol refers all disputes that cannot be settled amicably to the Tribunal, whose decisions will be final and binding (Böge 2006: 23). This provision may be ignored. In 1996, Botswana and Namibia preferred to submit their border dispute along the Chobe river to the International Court of Justice rather than to the Community Tribunal. In it's ruling, the Court decided in favour of Botswana, which was accepted by both contending parties (International Court of Justice 1999).

15.3.3 From National Water Sector Reforms to River Basin Organizations

Translating agreements into state practice is challenging. Southern Africa has a two-pronged approach that focuses on the establishment of catchment organizations within each country and basin organizations for transboundary watercourses. Eventually both institutional innovations should connect with each other. This approach does not come from careful design, but emerges from transboundary river organizations with strong institutional foundations and user involvement at the local level. This section first briefly reviews the water reforms and initiatives at national level before turning to transboundary watercourses.

Since 1994 at least eight southern African countries have adopted new water policies and/or laws (Table 15.4). A regional consensus appears to be emerging on several principles concerning the management of water. These include: the State owns the water in trust for the people; all people have a right to a basic amount of water without needing a formal right or permit; the environment is a legitimate water user whose needs must be considered along with other types of water requirements; the allocation of water for uses other than human survival and the environment, i.e., for productive processes such as agriculture, mining, and manufacturing, is subject to licences or permits subject to annual fees; states acknowledged the legitimate needs of other watercourse States; all uses of water are regulated by a central water management body within a particular Ministry; day-to-day water allocation and management is delegated to de-centralized bodies constituted along hydrological boundaries; de-centralized catchment institutions provide for stakeholder participation; and the de-centralized catchment institutions are to be self-financing.

Thus a new 'water architecture' is under construction, with catchment bodies being established. In the catchment institutions, the involvement of water users is actively pursued, as is the case in the sub-catchment councils in Zimbabwe. The catchment bodies are supposed to play key roles in day-to-day water management within countries and form an important institutional layer in the management of entire basins. They are to develop water resources strategies and plans within their respective hydrological units that will be important inputs in the development of national integrated water resources management/water efficiency plans as agreed during the World Summit on Sustainable Development in Johannesburg in 2002. Despite these promising developments many researchers have questioned the process and content

Table 15.4 Status of water policy reform in mainland SADC countries (Updated from Eberhardt 2003)

Country	The reform process
Angola	New water legislation (2002), with a comprehensive Water Sector Development Strategy drafted.
Botswana	The Water Act of 1968 still applies; a National Water Master Plan (1991) proposed policies and legislation but has not been enacted.
Dem. Rep. of Congo	No formal water policy; a national water code awaits endorsement by Parliament, drawing from prior water legislative from o the 1950s.
Lesotho	The Water Resources Management Policy approved by Cabinet in 1999 but is not detailed and is not consistent with existing legislation, including the Water Resources Act of 1978; revision planned.
Malawi	Water Resources Act (1969) and subsequent amendments applicable, along with the Water Resources Management Policy and Strategies of 2000. A draft water law (Water Resources Bill) has been prepared.
Mozambique	A new Water Law (1991) following extensive reforms in the 1980s; a new National Water Policy (1995); work on a new strategy is ongoing; regional water authorities have been established.
Namibia	Water Supply and Sanitation Sector Policy (1993) after independence (in 1990); a new Namibian National Water Policy (2002); a new Water Resources Management Bill (2004); Basin Management Committees are forming in all river basins.
South Africa	The new National Water Act (1998); Catchment Management Agencies are being established in priority river basins.
Swaziland	The 1967 Water Act (still current) is to be replaced with a new Water Act, which has been prepared but has not yet been enacted into law. A national water resources master plan is to be prepared. River boards will be established.
Tanzania	The Water Utilization (Control and Regulation) Act (1974), with amendments (1989, 1997); a new National Water Policy, developed over 7 years and replacing the 1991 policy. Basin Water Boards developed in the 1990s, to be strengthened by Catchment Water Committees.
Zambia	The Water Act (1948) is still in force; a National Water Policy focusing on basic water supply and sanitation; a water resources management plan (1994) led to the National Water Supply and Sanitation Act (1997); reforming water resources management commenced in August 2001, with the Government implementing the Water Resources Action Programme which is guided by the principle of integrated water resources management; a new legal and institutional framework is being developed.
Zimbabwe	A Water Resource Management Strategy process, begun in 1995, resulted in a new national Water Policy and a new Water Act (1998) (replacing the 1976 Act); the Zimbabwe National Water Authority Act also passed; catchment and sub-catchment councils established throughout the country

of these water sector reforms (Manzungu 2002, 2004; Sokile & Van Koppen 2004; Swatuk 2002, 2005; Waalewijn et al. 2005; Van der Zaag 2005a).

For nearly all transboundary watercourses in the South African Development Community, existing institutions provide means for riparian countries to communicate

and negotiate with each other. Most of these institutions came into being as a result of agreements concluded in the 1980s and 1990s (Table 15.4), and started off as permanent technical committees or joint water commissions with limited mandates to (a) keeping bilateral and/or multilateral communication channels open through consultations; and (b) informing and advising the respective governments at the ministerial level.

These technical committees have often performed important functions, even during times of political tensions (Savenije & Van der Zaag 2000; Van der Zaag & Carmo Vaz 2003). Since the mid 1990s, the trend is to convert these technical committees into full fledged executive style river-basin organizations where riparian countries delegate some decision-making powers to such transnational institutions, giving them a specific mandate of their own with a budget and a secretariat.

This trend exists because southern Africa has a unique enabling political environment and legal framework focused on integration and cooperation. South Africa, 'the benevolent hegemon', currently uses its economic and political might to promote an integrative-cooperative approach (Böge 2006: 48). Furthermore, donors support this process, with different donors supporting different basins. Today, the Swedes support the Zambezi and the Pungwe, the Germans the Orange-Senqu and Limpopo, and the Dutch the Incomati. There are river basin organizations for the Okavango (the Okavango River Basin Commission) and the Orange-Senqu (the Orange-Senqu River Basin Commission) and such organizations are being created for the Zambezi (the Zambezi River Basin Commission) and the Limpopo (the Limpopo River Basin Commission). Establishing such organizations is difficult, because it encroaches on the sovereignty of countries, especially in relation to a resource as vital as water.

Contrast the progress between the Limpopo and the Incomati, and focus on form and content. On the Limpopo, negotiations began in 1995 concerning the formation of the basin commission. Little has been achieved beyond an agreement on paper and an intention to establish a fully fledged commission by 2007. On the Incomati, no time was wasted on form; the Tripartite Permanent Technical Committee established in 1983 proved a good vehicle to negotiate a far-reaching 'Tripartite Interim Agreement between Mozambique, South Africa and Swaziland for Cooperation on the Protection and Sustainable Utilization of the Water Resources of the Incomati and Maputo Watercourses' (Tripartite Interim Agreement 2002). This agreement commits the riparian countries to guarantee cross border and environmental flows, and specific limits are defined on the further expansion of water developments and withdrawals for each country. It is only after having made this great progress that a need was felt to support the Committee with a secretariat. The conclusion must be that the scaling up of executive powers beyond the riparian states does not automatically lead to an increased effectiveness of transboundary water management at the basin scale. Experience so far seems to show that while national governments have a frail record of effective governance, multilateral organizations often do worse.

Finally, progress with respect to interconnecting the basin-wide institutions with their in-country catchment organizations is already happening on the Zambezi, where national steering committees have been formed in all eight riparian

countries consisting of the water authorities and representatives of different groups of water users, including local governments and irrigators. In some countries (e.g., Zimbabwe) these steering committees are the catchment management institutions established under the national water reforms. These committees provide direct inputs into the Zambezi basin strategy and break the former monopoly of central government actors in dealing with transboundary issues allowing cooperation between water user groups.

15.4 Conclusion

This chapter reviewed the formal policies and practices of transboundary water management in southern Africa. The ongoing innovative experiments, of simultaneous water management reforms at the country, transboundary basin and regional levels may be of interest to other regions. These reforms may potentially reinforce each other and achieve the integrated management of water possible from the farmers' field through to the basin level. Some aspects of transboundary river basin management in southern Africa need further discussion. These are the interplay between institutions and hydraulic infrastructure, stakeholder involvement, environmental flows, interbasin transfers, and the monitoring of agreements.

15.4.1 Basin Level Management: The Interplay of Institutions and Infrastructure

Interstate cooperation is often limited to regular meetings of a permanent committee with a limited mandate that focuses on the exchange of certain data and the notification of each other's development plans. In exceptional cases, riparian countries jointly develop, own, and operate infrastructure: the Maguga dam on the Incomati is jointly owned by Swaziland and South Africa, the Kariba dam on the Zambezi by Zambia and Zimbabwe, and the Katse dam of the Lesotho Highland Water Project on the Senqu-Orange by Lesotho and South Africa. These large hydraulic works in heavily committed basins make it imperative and feasible to synchronize the operation of such works and to reach agreements over maximum development levels and minimum cross-border flows. It is here that executive basin commissions are necessary.

15.4.2 Stakeholder Involvement

The water sector reforms have created formal spaces where stakeholder representatives participate in decision-making at the catchment level. This welcome development has been questioned because underprivileged stakeholders may be unable to articulate their needs and interests effectively and such spaces may

be captured by the privileged instead. Nevertheless, the new water architecture is gradually having an impact on transboundary water management. The fact that stakeholders should be involved in water decisions within countries exposes the lack of public participation in interstate water agreements. Water users become increasingly suspicious and demand transparency, especially in cases where water shortages in transboundary basins trigger localized tensions. The new water forums, where water user representatives discuss plans and allocation issues within each country, provide an opportunity to establish cross border links with their counterparts. Such forums exist in the three riparian countries of the Incomati (catchment management agencies in South Africa, regional water authorities in Mozambique, and the proposed river basin authorities in Swaziland) and the Zambezi (where all major groups of water users in all eight riparian countries are represented). Linking catchment-based forums across borders to form basin-wide platforms could deepen and balance interstate agreements, enhance mutual understanding, and widen the perspective that water users have of their basin (Böge 2006: 51; Cleaver & Franks 2005). Moreover, such linking makes sense if we consider that the national borders in southern Africa are highly artificial: 'goods, people, resources, animals and so forth continue to ignore these borders' (Swatuk & Vale 1999: 398).

15.4.3 Environmental Flows

Including environmental water requirements in the negotiations over water sharing added a new dimension in the case of the Incomati and created new opportunities. An upstream country may find it easier to agree to reserve water for environmental needs (that are largely non-consumptive) within its territory than honour consumptive water claims of a downstream country. Yet for the downstream country, it may imply the same consequence. Environmental flows therefore play an interesting role in transboundary river basin management.

15.4.4 Interbasin Transfers

Interbasin water transfers connect basins that are naturally unconnected. Such transfers may gain in prominence in the future mainly to satisfy the increasing urban and rural needs. Such transfers require water management decisions 'beyond the basin'. No legal framework regulates transfers between international watercourses, apart from the general principles of international and environmental law. This is cause for concern as some of the 'wilder' transfer schemes that are currently being contemplated may have environmental and other impacts that are potentially large but impossible to predict with any measure of precision. An example is the transfer of water from the Congo into the Zambezi and thence into the Okavango. The fact that Heyns (2003) identifies several proposed transfer schemes as future hotspots gives further credence to the seriousness of this phenomenon. There are also other concerns. Interbasin transfer projects are often complex and their opera-

tion relies on sophisticated expert systems. This may limit the role of the public in scrutinizing whether the public interest is being served. Moreover, frequently such water transfers are considered of strategic importance by a country, beyond the mandate of catchment agencies. This is especially true when such transfer schemes are an (additional) source of water for capital cities or generate key resources to the private sector (electricity, irrigation water) (Gupta & Van der Zaag 2008).

15.4.5 Monitoring

Most transboundary basin agreements do not include any mechanism for monitoring and enforcement. The opportunities created by monitoring through remotely sensed images that are, in principle, accessible to all should not be underestimated. The fact that all parties have the possibility to observe each other's compliance at all times, and are aware of this, may be sufficient incentive for all to comply. This may turn out to be a strong factor behind confidence building. Further, a basic condition of transboundary water management, data sharing, be it from remotely sensed sources or from the World Hydrological Cycle Observing System network or from national sources, remains the foundation of cooperation (Magaia & Van der Zaag 2006).

15.4.6 The Way Forward

Southern African people and nations have several features in common. Physically, water resources are scarce and variable. Historically, the region shares a common heritage and therefore a common identity. The history of water management during the last 20 years shows that the common identity has been an important factor in successful transboundary water resources management. Further economic integration of the region is a likely prospect that results from these historical contingencies, but may, in turn, strengthen transboundary water management. As much as a common identity may be a condition for transboundary water management, it may also be a result of it. These dynamically linked features may prove important for a peaceful and prosperous future.

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Chapter 16
The Jordan Basin: Evolution of the Rules

Robbie Sabel

Abstract The Jordan River basin extends from the slopes of Mount Hermon to the Dead Sea. Israel, Jordan, Lebanon, the Palestinians, and Syria are riparian to the Jordan River or its tributaries. Most plans for the basin waters were based on treating the basin as an integral whole, although no basin-wide agreement has been reached. The determination of political borders sometimes has reflected water issues. Israel and Jordan have an agreement reflecting the allocations of the Johnston Plan. Israel and the Palestinians have an interim agreement on water. The riparians have not denied the relevance of customary international law, but their agreements have not explicitly referred to the customary rules.

Keywords Dead Sea • Ghor Canal • Johnston Plan • Jordan River • Yarmuk River

16.1 Introduction

The Jordan basin is part of the Dead Sea-Red Sea Rift, which is a part of the Syrian–African Transform System. It extends from the southern slope of Mount Herman (2,800 m) in the north to the Dead Sea (−424 m) in the south, and includes the watershed of the Naftali, upper Galilee, lower Galilee, Yissachar, Gilboa Hills, and the Samarian and Judean mountains in the west, and of the Golan, Hauran, Gilead (Jebel Ajlun), and Moab mountains in the east, covering 18,300 km^2 (Lowi 1993: 20). Israel, Jordan, Lebanon, the Palestinian area, and Syria are riparian to its waters. These waters are critical for Israel, Jordan, and the Palestinians, and less so for Lebanon and Syria (Lowi 1993: 108). The River Jordan rises from Mount Hermon, flows over 228 km into Lake Tiberias (known also as Sea of Galilee or Lake Kinneret), and from there down into the Dead Sea. Although it is the region's principal river, its flow is relatively small: 'less than three percent of the Tigris …

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and not much more than one per cent of the Nile' (Stevens 1956: 240). It supplies more than 50% of the combined demand of Israel and Jordan and about 5% of the total demand of Syria and Lebanon (Murakami 1995: 207).

The River Jordan is fed by the Banias (121 Million Cubic Metre ('MCM') annually), the Dan (250 MCM), and the Hasbani (138 MCM). At their confluence, the average annual joint flow is 517 MCM. The total annual amount of water entering Lake Tiberias from all sources is estimated to range between 474 to 600 MCM (Kantor n.d.). The River Jordan's major tributary is the Yarmuk (400 MCM), which enters the Jordan some 10 km south of Lake Tiberias, with intermittent tributaries further below. The Jordan River empties into the landlocked Dead Sea. The total historic annual average contribution to flows south of the Yarmuk–Jordan confluence was 523 MCM, making the total stream-flows before withdrawals about 1,400 MCM annually. Two perennial streams, the Zarka Ma-in and the Mojib (Arnon), flow directly into the Dead Sea from the East. On the western side of the basin, the North-Eastern Aquifer (140 MCM) and the Eastern Aquifer (100–125 MCM) feed into the lower Jordan Valley and the Dead Sea. The natural replenishment and storage areas of the Eastern Aquifer extend under the greater part of the Palestinian Territories. To the east of the River Jordan, aquifers flow into the lower Jordan valley and the Dead Sea with an average annual yield of 270 MCM.

16.2 Political Boundaries and Water Boundaries

Concerns about water played a role in shaping political boundaries within the basin.

16.2.1 Political Entities in the Basin

From the fifteenth century CE until the end of the First World War, the Jordan basin was wholly within the Ottoman Empire. With the dissolution of the Empire, Great Britain and France administered parts of the basin under mandates from the League of Nations. The British mandate over Palestine stipulated for 'the establishment in Palestine of a national home for the Jewish people, it being clearly understood that nothing should be done which might prejudice the civil and religious rights of existing non-Jewish communities in Palestine' (League of Nations 1922: preamble). Syria became independence in 1936, Lebanon in 1943, and Jordan in 1947, although Jordan, at first a part of the Palestinian Mandate, held a semi-independent status throughout the Mandatory period. In 1947, the UN General Assembly Res. 181 (1947) recommended that Palestine be divided into Jewish and Arab States. Israel declared its independent in 1948. Military conflict between the new State and neighbouring Arab States ended in 1949 with armistice agreements that set out demarcation lines (the 'Green line') (Brawer 1989). Jordan took over the area of Palestine on the West Bank of the river left from the land allocated for an

Arab Palestinian State. Following war in 1967, the West Bank came under Israeli Administration. In 1988, Jordan relinquished its claim to the West Bank in favour of the Palestine Liberation Organisation ('PLO'). In 1993 Israel signed an agreement with the PLO recognizing an interim self-governing Palestinian authority in the West Bank and Gaza, with the final status of these territories to be negotiated later. As of 2008, these negotiations have not been concluded. This chapter treats the Palestinian Territory as entitled to riparian rights.

16.2.2 Setting the Boundaries of Palestine

Before World War I, administrative boundaries between *vilayets* of the Ottoman Empire determined the boundaries within the Jordan basin. In 1916, during the war, Britain and France signed the Sykes–Picot agreement on the future of the Ottoman Empire, agreeing that they would take control of part of Palestine and Syria/Lebanon respectively, with an area to be internationalized. These borders apparently did not consider water rights. In 1920 the Supreme Allied Council agreed that Britain and France should determine the new boundaries. The Treaty of Sèvres (1920) containing this provision was not ratified; it was only in the Treaty of Lausanne (1923) that Turkey formally renounced rights to its former empire.

After 1918, water rights were more prominent in British considerations. British Foreign Secretary Balfour wrote in 1919 that: 'It is eminently desirable that [Palestine] should obtain the command of the water-power which naturally belongs to it, whether by extending its borders to the north, or by treaty with France on behalf of Syria, to whom the southward flowing waters of Hamon (*sic*) could not in any event be of much value' (Ingrams 1973: 73). During the 1920 negotiations with France, the British position was extended to include 'due provision for the future utilisation by Palestine of the waters of the Yarmuk and the Litani, which may well prove vital to the economic development of the country and the creation of a national home for the Jews' (Toye 1989, 3: 101). The Franco-British Convention (1920) placed the Dan (Tel-el-Kadi) and the Banias springs in Palestine, but the agreement also made Syria a riparian on the River Jordan and divided Lake Tiberias between Palestine and Syria. The Yarmuk valley was to be in French controlled territory, while the agreement did not refer to the waters of the Litani. Article 8 of the treaty authorised 'employment, for the purposes of irrigation and the production of hydro-electric power, of the waters of the upper Jordan and the Yarmuk and of their tributaries, after satisfaction of the needs of the territories under the French mandate', while the French Government agreed to 'give its representative the most liberal instructions for the employment of the surplus of those waters for the benefit of Palestine'.

The parties agreed to establish a commission to delimitate the boundary on the ground (art. 2). This boundary commission made substantial changes to the boundaries set out in the 1920 Agreement, influenced largely by considerations of not dividing lands owned by local Bedouin Sheiks. The Boundary Commission's

Final Report (1920) placed the boundary parallel and east of the River Jordan, putting the whole River Jordan north of Lake Tiberias within Palestine. The boundary in the northern part of Lake Tiberias was to be '10 metres from the edge of Lake Tiberias, following any alteration of level consequent on the raising of its waters owing to the construction of a dam on the Jordan south of Lake Tiberias', placing the lake wholly within Palestine. Inhabitants of Syria retained traditional fishing and navigation rights on the Lake. The Report allocated the Banias spring to Syria, stipulating that the British Government could reopen the question; the British Government did not raise the issue. These boundaries were approved by the League of Nations, together with the 1920 convention (League of Nations Resolution 1922) and were reconfirmed in the Franco-British Agreement of 1926 (Biger 2004).

Questions of water rights played only a minor part in the determination of the boundary between Palestine and Transjordan in 1922, presumably because both territories were under British Mandate. The boundary, 'up the centre of the Wady Araba, Dead Sea and River Jordan to its junction with the River Yarmuk: thence up the centre of that river to the Syrian frontier', was approved by the Council of the League of Nations in 1922 (Toye 1989, 3: 745–746).

16.2.3 Boundaries and Water Issues After 1945

The 1947 UN plan to partition Mandatory Palestine into Jewish and Arab States granted the proposed Jewish State the Dan spring, the whole of the upper Jordan and Lake Tiberias, and made the proposed Arab State riparian to the lower Jordan River (UN GA R. 181 1947). Israel's 1948 Declaration of Independence did not set out national boundaries. The 1949 Armistice Agreements with Egypt, Jordan, Lebanon, and Syria set armistice lines that were *de facto* boundaries until 1967, based on the former boundaries of Mandatory Palestine, with changes reflecting the positions of the armies at the cessation of hostilities. As Brawer (1989: 68) wrote, 'Of all the blunders in the delimitation of the 'Green Line,' perpetrated through ignorance or negligence, the worst were cases in which vital water resources were rendered inaccessible to villagers who depended on them'.

Water issues influenced the Israel–Syria armistice negotiations because Syria wanted access to Lake Tiberias (Shalev 1993: 183). While the 1923 International Boundary between Palestine and Syria was drawn east of the River Jordan, the Israel–Syrian Armistice provided that at some places the Armistice Line was along the river itself. Syria claimed riparian rights where it had access to the river (Alster 1996: 5). On Lake Tiberias, the Armistice Line followed the International Boundary (10 m from the water line of Lake Tiberias), although until 1967, Syrian troops in reality were at the water's edge. Between 1953 and 1967, Syrian boats fished in the waters of the north-east of the lake–justified by fishing rights in the 1923 Agreement, although Syria did not formally acknowledge the validity of the 1923 Agreement and the 1949 Armistice agreement made no reference to such rights. Israel frequently complained to the Israel–Syrian Mixed Armistice

Commission that the fishing violated the 1949 Israel–Syrian Armistice Agreement and used armed patrol boats to deter such fishing.

The divergence between the Armistice Line and the International Boundary for water issues was stressed during peace negotiations with Syria. '[F]or Rabin, the difference had meaning for Israeli control of water. Specifically their need to preserve the Jordan and Hasbani Rivers on the Israeli side of the border. … Rabin no doubt feared that an actual presence on [Lake Tiberias] would give the Syrians a share of Israel's only natural freshwater reservoir' (Ross 2004: 114, 130). Syria rejected the 1923 Boundary as having been imposed on Syria by Britain and France (Seale 2000: 70). When this border is determined in the future, a relevant issue will be the rule of *uti possidetis juris*, according to which former colonial boundaries remain in force unless changed by agreement. Although the peace treaties with Egypt and Jordan did not refer to *uti possidetis*, the treaties adopted the former Mandatory boundaries, as did the UN determination of the Israel–Lebanon boundary. Boundaries between Israel and Syria, and Israel and the Palestinian Territories are not yet determined.

16.3 The Johnston Plan

Water was one of the few issues on which Israelis and Arabs continuously cooperated. As Dellapenna (1994: 100) wrote about the Jordan basin: 'although the importance of water might appear to generate conflict, it has in fact made cooperation more likely than conflict'. The basin states and the international community proposed various plans for the waters of the basin (e.g., Chas. T. Main Inc. 1953; Hays 1948; Lowdermilk 1944). The 1953 'Johnston' Plan, mediated by the US, was in a sense the culmination of these plans. The 1954 'Cotton' Plan commissioned by the Israeli government, and the 1954 'Arab' Plan, and the 1956 'Baker-Harza' Plan commissioned by Jordan, were unilaterally sponsored plans that were not implemented (Stevens 1956).

The Johnston plan proposed 'that distribution be so arranged that neither side would have physical control over it' (Stevens 1956: 273). Lake Tiberias was to be used by Israel for storage of Jordan waters and Jordan was to build a dam at Maqarin for storage of River Yarmuk waters. There was no reference to the waters of the Litani River. There were no restrictions on transferring water allocations outside the basin. Water was allocated in quantities, not percentages, and the plan designated the recipients of any residue waters beyond specified allocations. Jordan was to receive all of the Yarmuk waters less specified allocations to Syria and Israel. Israel was to receive all of the waters of the Jordan River less a specified allocation to Jordan, although there was disagreement as to how much of the allocation could be brackish water. Syria received an allocation from the Banias spring, and Lebanon an allocation from the Hasbani. One hundred and fifty million cubic metres a year out of Jordan's allocation of the Jordan was intended for the West Bank.

According to the 1955 Report by President Eisenhower to US Congress, '[u]nder the plan… approximately 60 percent of the water of the Jordan River system was to be allocated to Lebanon, Syria and Jordan, and the remaining 40 percent to Israel' (Peace Process, VII: 8). Although the technical experts of Israel, Jordan, Lebanon, and Syria agreed upon the plan, the Arab League—probably because of unwillingness to recognise Israel—decided on 11 October 1955 not to approve the plan but to refer it back to its Technical Committee for 'further consideration until an agreement safeguarding Arab interests would be reached' (Lowi 1993: 108).

16.4 Implemented Projects

Despite the absence of any agreed plan for the basin, Israel, Jordan, Syria, and, to a lesser extent Lebanon, carried out unilateral water diversion projects. For Israel and Jordan, the projects were mostly within the parameters of the Johnston Plan.

16.4.1 Israel's National Water Carrier

In 1950, Israel began planning to divert Jordan River water, originally planning to commence the diversion from the upper Jordan River at the Bnot Yaakov Bridge and to store the water in the Bet Netufa valley. In 1953 Israel commenced diversion works near the bridge. Syria objected that the works were in the demilitarized zone and, hence, Israel had no right to carry out engineering activities there. The Israeli position was that the territory was under its sovereignty and only subject to demilitarization under the 1949 Armistice with Syria. The UN Security Council, without determining sovereignty, called upon Israel to cease its diversion works and Israel complied. Israel then decided to use Lake Tiberias as the storage area. This change of plans necessitated pumping water up from the Lake, whereas the original plan would have relied on gravity flow. To prevent salinisation of the water in the National Carrier, Israel diverted saline springs around the Lake, discharging them into the lower River Jordan. The Israel National Water Carrier, which began operating in 1964, pumps 400 MCM annually from Lake Tiberias and distributes it through a 112 km long carrier throughout Israel via regional water schemes (Kantor n.d.). The amount of water that Israel diverts from Lake Tiberias is within the quantities envisaged in the Johnston Plan.

The neighbouring Arab states attempted to thwart the Israel National Water Carrier through a diversion plan, originally approved by the Arab League in 1954. The plan was to divert the waters of the Hasbani into the Litani in Lebanon and thence to the Mediterranean and the Banias, by way of the Golan Heights, to the Yarmuk River and then discharge the waters to the East Ghor canal or to the lower Jordan River. A decision to implement the plan was taken at an Arab Summit conference in 1964. It would have 'cut by 35% the installed capacity of the Israel Carrier' (Wolf 1995: 2). Israel considered the plan to be an act of spite: 'The aim

of the project was not to satisfy economic needs upstream, but rather to damage Israel for political ends—or at least to demonstrate that Israel could not appropriate "Arab" water with impunity' (Shepland 1995: 313). Work commenced by Syria and Lebanon in 1965 was interrupted by Israeli military action in July 1966 and not resumed.

16.4.2 Jordanian Works

In 1958, Jordan commenced work to divert waters of the Yarmuk River into a tunnel near Adasiya and from there in an open 110 km long channel, parallel to the Jordan River on its eastern Bank. This canal, named the King Abdullah East Ghor Canal, is a major source of water for Jordan. Plans for a parallel canal project along the West Ghor to be fed by a siphon from the East Ghor canal were never implemented (Elmusa 1996: 21). Following the 1967 War, Jordan lost control of the West Bank and since then there has been no progress on the plan for a West Ghor canal.

In the 1980s, Jordan requested World Bank financing for a proposed dam at Maqarin on the Yarmuk River. Israel objected to the project until an agreement was reached on sharing the waters. The US diplomat Philip Habib was sent in 1980 to help mediate an agreement. Although Habib was able to gain agreement in principle on the dam, negotiations ran into difficulties regarding winter flow allocations to Israel and a final agreement was never reached. In 1987, Jordan reached an agreement with Syria to build the 'Al Wehda' dam at Maqarin. The project was inaugurated in 2004 but because of diminished flow from Syrian territory into the Yarmuk, the dam has been built with a smaller storage capacity than originally conceived.

16.4.3 Syrian Works

In the 1980s and 1990s, Syria built several small-to-medium size dams on the Golan Heights and on the upper Yarmuk that currently supplies the population of Southern Syria with some 250 MCM of water (Sofer n.d.). These dams decreased the flow in the Yarmuk River and in the wadis leading to Lake Tiberias.

16.4.4 The Hasbani River

In 2001, press reports described Lebanese intentions to pump 10,000 m^3 of water per day at the Wazzani Spring on the Hasbani River for drinking water for 60 villages near the border. Israel objected, claiming that this would substantially reduce the flow of the Jordan River. The quantities withdrawn apparently were limited to the amounts in the Johnston Plan for there has been no further official Israeli reaction.

16.5 The Legal Basis for Arrangements on Water

This section deals with existing legal frameworks in the Jordan basin and examines the extent to which customary international law (Chapter 19, Laborde, this book) is relevant.

16.5.1 The Legal Status of the Johnston Plan

The Johnston Plan did not address legal rights or the legal basis for its proposed allocations. The US State Department however, commented that the allocations were based on the principle of 'equitable distribution' between the riparians (Whiteman 1964: 1017). As between Israel and Jordan, 'the Johnston Plan became the *de facto* discussion point and measuring rod for all subsequent efforts at developing the Jordan waters' (Lowi 1993: 105). The Plan is not, however, an international agreement. The parties were presented texts that differed slightly so there was no consensus on a common text. Neither side ratified the Plan nor was it registered with the UN Secretariat as a treaty. Syria and Lebanon did not declare that they would abide by the Johnston Plan, although Israel and Jordan each unilaterally declared that they would; these declarations could be a binding unilateral undertaking or a binding regional custom (Dellapenna 1990: 43).

16.5.2 Jordanian–Israeli Understandings on theYarmuk River

Beginning in the 1970s, Israeli and Jordanian water experts met regularly to discuss allocations from the Yarmuk River during the summer season (Wolf & Ross 1992: 935). These semi-confidential talks continued until the 1994 Israeli–Jordanian Peace treaty. During the winter months, Israel diverts excess Yarmouk floodwater, downstream of the intake of the King Abdullah East Ghor Canal, for storage in Lake Tiberias, capturing floodwaters that would otherwise be lost to the lower Jordan River and the Dead Sea. The Israeli right to use these excess waters was recognized in the Israel–Jordan peace treaty. Once the Maqarin Dam is in full operation, there probably will be little of such floodwaters.

16.5.3 The Israel–Jordan Treaty of Peace

Water was a critical issue in the Israel–Jordan Peace Treaty negotiations. The Treaty (art. 6) states that in order to achieve comprehensive and lasting settlement of all water issues,

> 9.The Parties agree mutually to recognize the rightful allocations of both of them in Jordan River and Yarmouk River waters and Araba/Arava ground water in accordance with the agreed acceptable principles, quantities and quality as set out in Annex II.
>
> The Parties … jointly undertake to ensure that the management and development of their water resources do not, in any way, harm the water resources of the other.

Annex II (art. II(1)) stipulates the quantities of water Israel is entitled to from the Yarmuk in the summer and winter periods, that Jordan is entitled to the remainder, and that both may use excess flood waters. The two States agreed to 'build a diversion/storage dam on the Yarmouk River directly downstream of the point Adassiya Diversion'. Israel agreed to transfer 20 MCM annually from the River Jordan to Jordan during the summer in exchange for Jordan transferring to Israel 20 MCM of Yarmuk water in the winter and an additional 10 MCM during winter until a planned desalination project became operational. Israel and Jordan also agreed to develop plans for the lower River Jordan. The States agreed to 'cooperate in finding sources for the supply to the Kingdom of an additional quantity of 50 MCM/year of water of drinkable standards' (Annex II: art. I(3)). An interpretation disagreement was apparently resolved at a 1997 meeting between King Hussein and Prime Minister Netanyahu whereby Israel agreed, as an interim measure, to supply Jordan with an additional 25–30 MCM a year from Lake Tiberias. Libiszewski (1995: 76) comments that the treaty's key weakness is that 'the settlement remains bilateral and thus conditional upon behaviour of the other riparians (especially Syria), with whom water agreements are still lacking'.

16.5.4 Israel and the PLO

The Israel-PLO 1993 Declaration of Principles refers to 'proposals for studies and plans on the water rights of each party, as well as on the equitable utilisation of joint water resources for implementation in and beyond the interim period' (Annex III: art. I). The 1995 Israel-PLO Interim Agreement set up a permanent Israel–Palestinian 'Joint Water Committee' whose functions include '[c]onsolidated management of water resources'. The Committee continued to function even during armed hostilities when most other avenues of cooperation ceased to function.

The interim agreement states that 'Israel recognizes the Palestinian water rights in the West Bank. These will be negotiated in the permanent status negotiations and settled in the permanent status agreement relating to the various water resources' (Appendix 1, Annex III: art. 40(1)). The parties agreed to maintain 'existing quantities of utilisation from the resources, taking into account the quantities of additional water for the Palestinians from the Eastern Aquifer and other agreed sources in the West Bank as detailed in this Article' and 'Both sides have agreed that the future needs of the Palestinians in the West Bank are estimated to be between 70–80 MCM/year' (art. 40(6)). Israel agreed to supply additional water to the Palestinians and the Palestinians were to develop further sources 'from the Eastern Aquifer and other agreed sources in the West Bank' (art. 7 (b)(6)). The parties

agreed on figures of average annual estimates for existing extractions, utilisation, and estimated potential of the shared Aquifers (Schedule 10).

16.6 Legal Issues

The several agreements do not fully resolve the legal (and practical) issues regarding the Jordan basin waters.

16.6.1 The Role of International Law

No multilateral treaty is in effect for allocating water resources of international drainage basins (Chapter 1, Gupta & Dellapenna, this book) and the 'evidence of customary international law is scattered, elusive and unsystematic' (Rosenne 2004: 36). None of the negotiated plans concerning the Jordan River basin refer to international law, possibly because of highly volatile and complex political and security issues. As an Israeli negotiator commented (Reisner 1995: 9):

> From the onset of the negotiations, it was evident that any attempt to resolve the Israel–Jordanian water problem through strict reliance on such legal terminology would be doomed to failure. … [I]n the final analysis, water disputes can only be resolved by the specific determination of quantities and quality of water to be allocated and not by means of general concepts. This rationale explains why the provisions of the Peace Treaty dealing with water issues tend to be more practical and operational, rather than legal in nature.

Nevertheless, the negotiating history mirrors the development of international water law. In fact, the contradictory arguments made by the riparians on the Jordan basin were one of the reasons that the Institute of International Law and the International Law Association studied and formulated customary law on the subject (Bourne 2002: 14). Before World War I, the law on shared watercourses was less developed, centring on the physical control of springs. Although the British insisted that both banks of the upper Jordan River be in Palestine, the reason was less to disallow Syrian riparian rights than to enable Palestinian engineers to build water facilities in Palestinian territory. Britain was willing to accept a border dividing Lake Tiberias between Palestine and Syria (Franco-British Convention 1920); it was the joint demarcation team that moved the boundary east of Lake Tiberias (Final Report 1920). Apparently no attention was paid to aquifers.

During the 1930s and 1940s, suggestions to partition Palestine between Jewish and Arab States did not explicitly refer to riparian rights. The 1947 UN Partition Plan did consider water issues. Little attention was paid to riparian rights in the 1949 Armistice Agreements. International water law became increasingly relevant after 1948 when the influx of Jews into Israel and Arab refugees into Jordan required more water for both States, leading them to plan large-scale engineering water works using Jordan River waters. Such works could affect other riparians

and guiding principles were required. The involvement of the United States and the World Bank required projects to be internationally legitimate.

16.6.2 Palestinian Riparian Rights?

Although the Palestinian Authority is not yet a State, Israel has recognized Palestinian water rights in the West Bank. These will be negotiated in the permanent status negotiations (Israeli–Palestinian Interim Agreement, Appendix 1, Annex III: art. 40(1)).

16.6.3 The Integral Basin Approach

The first emerging international law principle applied in the area was perhaps to regard the basin as an integral whole. This principle appeared in all basin plans. There is, however, no basin-wide agreement; separate arrangements have been reached between Israel and Jordan and between Israel and the Palestinians. Customary rules are *jus dispositivum*, and the parties to an agreement, unless *jus cogens* is involved, are free, between themselves, to deviate from a customary rule. It remains to be seen whether a future peace process will develop a basin-wide agreement.

16.6.4 Avoidance of Appreciable Harm

The obligation not to utilize territory so as to cause appreciable harm to a neighbouring state is well-established in international law and has not been disputed in the area.

16.6.5 The Duty to Notify

Customary international law obliges states to 'promptly notify other States or competent international organizations that may be affected significantly by a programme, plan, project, or activity' (International Law Association 2004: art. 57(1)). Even while Israel and Jordan were formally at war, they informally notified each other of their plans and projects. The Palestinian Authority, created in 1993, has continuously liaised with Israel on water issues. The contacts between Syria and Israel have been more problematic and the parties have had to rely on available public announcements. The Lebanese Government did not give Israel notice of its 2001 diversions from the Hasbani. Israel, however, was aware of them through press reports and observation.

16.6.6 Equitable Utilisation

The International Law Association (1966: commentary) has noted that '[i]n the Jordan basin dispute between Israel and certain Arab states, both sides have adhered to the position that each is entitled to a reasonable share of the basin waters'. 'Today the principle of equitable utilisation is universally accepted as basic to the management of the waters of an international drainage basin' (International Law Association 2004: commentary). The Johnston plan did not explicitly base itself on legal principles but on the available irrigable land. The US State Department, however, saw this as an equitable division, explaining '[t]he limited waters of the Jordan River system should be shared equitably by the four states in which they rise and flow' (Whiteman 1964: 1017). The Israeli Prime Minister also referred to the Johnston Plan as providing for 'an equitable apportionment of the waters of the Jordan River system … consistent with customary international law' (McCaffrey 2001: 270 n.284). The Johnston Plan allocated the waters of the Yarmuk River to Jordan, minus a specified allocation to Israel, and the waters of the River Jordan to Israel, minus specified allocations to Jordan, Lebanon, and Syria. This can be viewed either as an application of a rule of territorial sovereignty tempered by allocations to neighbouring States or as an innovative application of equitable utilisation on a basin-wide basis.

The 1993 Israel-PLO Declaration of Principles (Annex III: art. I) refers to 'proposals for studies and plans on water rights of each party, as well as on the equitable utilisation of joint water resources for implementation in and beyond the interim period.' McCaffrey (2001: 279) concluded that '[w]hile it may be said that this text recognizes the value of equitable utilisation of water resources shared by Israelis and Palestinians, it falls short of acknowledging an obligation to apportion those resources equitably'. Jordanian negotiators commented that Jordan 'succeeded in sharing the remaining flow of the Jordan River, excluding the flow of the Yarmuk of course, in equal amounts with Israel along our borders with it' (Majali et al. 2006: 310). The Peace Treaty, however, did not refer to law or to 'equitable utilisation'. A final allocation between Israel and the Palestinians presumably will reflect the Johnston Plan's allocation of 150 MCM to the West Bank, but how or from where this will come is far from clear.

Whether equitable utilisation necessitates redistribution (Elmusa 1993b: 10) requires consideration of several rules: 'no harm,' 'respect for prior use,' and 'equitable utilisation.' According to the International Law Association (2004: arts. 12, 16), the 'no harm' and the 'equitable utilisation' rules have equal status. How to combine these rules must be negotiated. The agreements reached between Israel, Jordan, and the Palestinians incorporate both of these legal elements. The rules of equitable utilisation have focused on quantities of water rather than on the quality of water. Although customary law aims to prevent pollution, little attention has been paid to natural differences of quality. This issue arose for the quantities of Jordan River water allocated in the Johnston Plan to Jordan; it appears to be resolved in the Israel–Jordan Peace Treaty and the Israel–PLO agreements.

16.6.7 Determining Equitable Utilisation

Equitable utilisation is 'to be determined through consideration of all relevant factors in each particular case' (International Law Association 2004: art. 13). Among the factors likely to be stressed in any future Israeli–Palestinian negotiations are 'natural features', 'prior use', 'future use', 'population', 'social and economic needs', and 'available alternatives.'

'Geographical, hydrographic, hydrolological, hydrogeological, climatic, ecological and other natural features' are prominent factors. Kuttub & Ishaq (1994) claim that Israel and the Palestinians are entitled to exploit their joint aquifers in proportion to the amount of rainwater that falls on the respective feeding areas in the territory of each party. Elmusa (1996: 37) acknowledged that 'geography, which favours them in the mountain aquifer, does not in the rest of Mandate Palestine's resources, including in the Jordan basin'. Dellapenna (2002: 61) adds that 'The Jordan Valley provides a prime example of why an algorithmic approach would result in inequitable utilisation: the primary contributors to water in the Jordan basin according to the pre-1967 boundaries are the Lebanese and Syrians, precisely the two communities that have the greatest alternative sources of water'. And Benvenisti and Gvirtzman (1993: 556) postulated that: ' "the natural attributes" thesis may be used to develop the opposite claim, namely that the water should be allocated according to the locations from which the waters naturally emerge'.

Another factor affecting equitable utilisation is '[e]xisting and potential uses of the waters'. The Chief Justice of the Supreme Constitutional Court of Egypt put the case for priority for existing uses, in the context of Egypt and the Nile: 'acquired rights which were established by use over an immemorial period of time, with the tacit or otherwise acquiescence of other riparians, cannot be denied' (El Morr 1995: 297). Benvenisti and Gvirtzman (1993: 548–549) wrote: 'among the human conditions, priority is given to past and existing uses, at the expense of potential uses. … The allocation of water is always historically contextualised. Communities settled in a certain basin because of the availability of water there. They have used the water and relied on its continued availability'. Elmusa (1993a: 67) has argued to the contrary:

> [I]t was fortunate for Israel that prevailing social and economic conditions before 1967 did not permit Palestinians to extract larger amounts from the common aquifers. Now that Israel has exploited that very water successfully to spur its own economic development, it is time that Palestinians be given the chance to develop their own economy—a process hamstrung by, among other things, lack of water.

Elmusa (1995: 234) has also noted that 'the natural attributes of the joint sources favour the Palestinians while prior use serves the Israelis'. The Israel–PLO interim agreement, while increasing allocations to the Palestinians, also refers to 'Maintaining existing quantities of utilisation' and the Israel–Jordan Peace Treaty states: 'Israel is entitled to maintain its current uses.'

'The social and economic needs of the basin States concerned' and '[t]he population dependent on the waters of the international drainage basin in each basin

state' also appear to have been taken into account in the Johnston plan, the Israel–Jordanian negotiations, and their Peace Treaty. Israeli re-allocations to Jordan were based on Jordan's urban water needs. The Israel-PLO agreement was based on an agreed estimate of Palestinian water requirements.

Another factor is '[t]he availability of alternatives, of comparable value, to the particular planned or existing use'—such as other sources of water supply or other means of meeting the needs in question without using water, such as alternative sources of energy or means of transport. The Johnston Plan seems to have taken this factor into account for Lebanon and Syria, which had other water supplies. The issue has been raised in regard to distribution between Israel, Jordan, and the Palestinians: because Israel is economically advanced and has desalination facilities, it has the alternative of using desalinated water instead of water from the Jordan River or the shared aquifers. The cost of using desalinated water for irrigation is, at present, prohibitive, however, and would require a high subsidy.

16.6.8 In-Basin Uses?

Israel, through its National Water carrier, transfers water from Lake Tiberias all the way to the arid Negev in the south. During the Johnston talks, Arab States argued that: 'the waters in a catchment area should not be diverted outside that area unless the requirements of all those who use, or genuinely intend to use, the waters within the area have been satisfied' (American Friends of the Middle East 1964: 90). Modern international law, however, does not appear to restrict 'out of basin use' and the issue was not pursued.

16.7 The Laws of Occupation

Some argue that the only permissible use of water by Israel in the occupied West Bank is for 'reasonable military and administrative needs and that any other use of water from aquifers is illegal under the laws of occupation' (Abouali 1998: 476). The counter-argument is that water must be provided for all residents, irrespective of nationality, that there was no diminution of water available to the Palestinian population, and that 'in fact water is pumped from Israel to the West Bank and not *vice versa*' (Wolf & Ross 1992: 946). Israeli policy has also been criticized for restricting the use of wells by the local Palestinians and that for providing local Israeli settlements greater water supplies *per capita* than the Palestinian population. The counter argument is that the depletion of the aquifers necessitates restriction of water use by all users and such restrictions also apply within Israel itself. Israeli water consumption, higher *per capita* than that of Palestinians, is supplied only from the Israeli National Water Carrier. Furthermore, whatever the position was before 1993, it is doubtful whether the West Bank should continue to be considered as occupied because the present water arrangements in the West Bank are based on Israel-PLO agreements.

16.8 Shared Aquifers

The law on aquifers is still controversial. Legal scholars (International Law Association 2004: art. 36; International Law Commission 2006) apply rules to shared aquifers similar to the rules applicable to shared watercourses. The issue of shared aquifers is particularly relevant in the Israel–Palestinian context as the water supply of the West Bank and Gaza comes from shared aquifers. Neither the Johnston Plan nor the Israel–Jordan Peace Treaty dealt explicitly with groundwater in the Jordan River basin. The 1995 Israel–Palestinian Agreement dealt with groundwater, authorizing the parties to maintain 'existing quantities of utilisation' and quantified the 'existing extractions, utilisation and estimated potential' of the several aquifers. Palestinian water rights in the West Bank were recognized by Israel, but left to the 'permanent status negotiations'. Both parties agreed to regulate the use of the common aquifers and to restrict further use as a starting point for future permanent status negotiations. International law is not explicitly mentioned in the agreements, but is nevertheless reflected in the outcome of the negotiations. Palestinians insist that the joint Palestinian–Israeli groundwater have to be included if a new basin-wide agreement is to be negotiated (Elmusa 1995: 226).

16.9 No Veto Power

International law requires that riparian States attempt to reach agreement on water projects affecting the common watercourse, but, if no agreement is reached, it allows a State to proceed unilaterally, provided the project does not violate the treaty or customary rights of other riparians. Riparian States do not possess a right to veto a project solely because no agreement was reached (Lake Lanoux Arbitration 1957). At times, both Israel and the Arab States have objected to the other's unilateral actions relative to the basin waters. The Arab States objected to Israel's National Water Carrier; Israel objected to the Arab Diversion Plan and initially to the Maqarin Dam Project. These objections were pressed on the basis of perceived harm and not on a claimed a right to veto.

16.10 Conclusions

Benvenisti (1996: 402) argues that the inchoate nature of international water law can cause 'the parties to negotiate … by stating a vague standard for water apportionment, rather than by setting a clear rule'. Dellapenna (1995: 83) suggests that the best approach is 'communal water management' as the parties cannot rely on the vague legal principle of equitable utilisation. None of the agreements regarding the Jordan basin explicitly refer to international law, but the agreements reveal the influence of international water law. Throughout negotiations, both official and

unofficial, negotiators included lawyers who came to meetings with copies of the relevant international law texts. The claims made about prior use, no harm, social and economic needs, in-basin use, equitable distribution and equitable redistribution all reflect different facets of rules of international law. The agreement between Israel and the PLO and the Israel–Jordan Peace Treaty both refer to the continuation of existing uses, tempered by increased allocations to the riparians. These agreements reflect a balance between the rights of existing users and equitable utilisation. Both are norms of international water law and the balance between them was achieved, as it must be, by negotiations between the riparians.

Future negotiations on the uses of the waters of the basin probably will include the aquifers, making the Jordan basin a testing ground for newly developing rules of customary law. The Israel–Jordan Peace Treaty and the Israel–PLO agreements both refer to water quality, again an issue, with the exception of pollution, that that has not yet crystallized in customary law. The international law of water resources is a composite of various factors, principles, and rules, some conflicting. A final agreed basin framework will inevitably require negotiating the various elements, but there can be no doubt, in the future as in the past, the groundwork will be international law.

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Chapter 17
The North American Great Lakes

Noah D. Hall

Abstract The Great Lakes are a vast resource shared by two countries, ten states and provinces, and hundreds of Indian tribes or First Nations. They are the quintessential commons that have seen their share of tragedies. Addressing competing pressures of economic development and environmental protection is only part of the challenge. The real struggle has been governance: How is management of an international transboundary resource best accomplished under the legal and political limitations of constitutional federalism? This chapter analyses the international agreements, court decisions, interstate compacts, and federal statutes that created a transboundary water regime, considering in detail the Great Lakes– St. Lawrence River Basin Sustainable Water Resources Agreement and Great Lakes–St. Lawrence River Basin Water Resources Compact as models for responding to stresses on transboundary water resources from climate change.

Keywords Great Lakes • transboundary waters • interstate waters • United States • Canada • climate change

17.1 Introduction

The Great Lakes are the world's largest freshwater resource, holding approximately 95% of the fresh surface water in the United States and 20% of the world's supply (Great Lakes Commission 2003). The five Great Lakes (Lake Erie, Lake Huron, Lake Michigan, Lake Ontario, and Lake Superior along with the St. Lawrence River and connecting channels) contain about 5,440 cubic miles of fresh surface water, with another 1,000 cubic miles of stored groundwater in the basin (Grannemann 2000). About 40 million Americans and Canadians obtain their drinking water from this basin (International Joint Commission 2000). More fresh water is at stake here than any other single freshwater resource in the world. The system covers parts

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of eight states and two provinces within the U.S. and Canada: Wisconsin, Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Ontario, Pennsylvania, and Quebec. Hundreds of tribes and First Nations and thousands of local governments and municipalities also share legal responsibilities.

Managing Great Lakes water is necessarily an exercise in cooperation among multiple jurisdictions and levels of government, with numerous and potentially overlapping legal regimes. This transboundary challenge has produced a rich history of law and politics that continues to develop today and demonstrates the evolution in transboundary water management from simple allocation and dispute resolution to cooperative environmental protection of a shared resource. As climate change further stresses global freshwater supplies, disputes and conflicts over transboundary water resources will intensify. The most recent Great Lakes developments, the Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement and Great Lakes–St. Lawrence River Basin Water Resources Compact, provide a model for managing a transboundary water resource in the climate change era.

17.2 The Boundary Waters Treaty of 1909

The Boundary Waters Treaty (1909) provided the foundation for transboundary Canadian–American water management for a century. Before 1903, no legal regime governed use of Great Lakes water. As the Great Lakes region was relatively undeveloped until the late nineteenth century, there was little pressure on Great Lakes water resources and no need for international legal rules. By the turn of the century, both countries saw a need to avoid conflicts over use of the shared waters. The United States and Canada first established the International Waterways Commission in 1903 to address potentially conflicting rights in the countries' shared waterways (Woodward 1988: 326). The International Waterways Commission recommended that the two countries adopt legal principles of shared water use and form an international body to protect the boundary waters. In 1907, the International Waterways Commission drafted a proposed treaty, which eventually led to the Boundary Waters Treaty of 1909. The Treaty (1909: preliminary article) provides for joint management and cooperation between the United States and Canada for the shared boundary waters defined as:

> the waters from main shore to main shore of the lakes and rivers and connecting waterways … along which the international boundary between the United States and… Canada passes, including all bays, arms, and inlets thereof, but not including tributary waters which in their natural channels would flow into such lakes, rivers, and waterways, or waters flowing from such lakes, rivers, and waterways, or the waters of rivers flowing across the boundary.

While tributary rivers and streams, as well as tributary groundwaters, are excluded from coverage, this Treaty governs four of the five Lakes (since Lake Michigan sits entirely within the United States), and other rivers and lakes that straddle or cross the border (Hall 2006: 416–417).

Navigation and access to boundary waters, not water management, was the principle concern in 1909 (Jordan 1971: 66–69). Nonetheless, the first draft included a provision forbidding water pollution having transboundary consequences to be enforced by an

international commission vested with 'police powers' (Jordan 1971: 66–67). The U.S. Secretary of State objected to these provisions, agreeing only to an anti-pollution provision limited to the defined boundary waters and no enforcement jurisdiction for the international commission. Thus, Article IV provides: 'It is further agreed that the waters herein defined as boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other'. There was some opposition to even this more limited provision in the U.S. Senate when ratification was being debated, founded on the risk of creating an international water pollution police power. Canada responded by assuring the Senators that the provision would be enforced only in 'more serious cases' (Jordan 1971: 67).

While the anti-pollution provision is more limited than Canada would have liked, it establishes a clear standard regarding pollution of shared transboundary waters. Such pollution is just one form of transboundary water pollution, as transboundary pollution often follows an indirect path of tributaries and different media (i.e., airborne pollution that is deposited into water bodies through precipitation). The underlying legal principle of Article IV, that one country's pollution should not harm another country, provides a foundation for U.S.–Canadian international environmental law (Hall 2007).

This Treaty also addresses the taking and diversion of boundary waters. Article III provides that neither party may use or divert boundary waters 'affecting the natural level or flow of boundary waters on the other side of the [border]' without the authority of the International Joint Commission. The Commission is a six member investigative and adjudicative body with the United States and Canada equally represented by political appointees. It is well respected in both countries and is often commended for its objectivity and leadership on environmental issues (Hall 2007: 706). The Commission's reports rely on the best available science and are free of nationalistic biases, making it an important source of information for the public and decision makers (Hall 2007: 707). Scores of issues have been referred to the Commission for non-binding investigative reports and studies pursuant to Article IX. The Treaty only requires a reference from one of the countries to invoke this process, although as a matter of custom this has always been done with the support of both countries (Hall 2007: 706–707). This bilateral approach has strengthened the credibility of the Commission's non-binding reports and recommendations, and ensured sufficient funding for its efforts. These reports and their objective recommendations have enabled diplomatic resolution of numerous transboundary water disputes and crafting new water protection policies.

17.3 Interstate Water Management

Interstate management of water resources in the United States has involved a combination of federal regulatory mechanisms and interstate dispute resolution and cooperation mechanisms. Despite many legal tools, management of interstate waters has posed tremendous challenges as '[c]ommunity interest in navigation upon common waters of adjoining States gave rise to difficulties prior to the Constitution, are pressing today, and are bound to manifest themselves in the future'

(Frankfurter & Landis 1925: 696). As discussed by Zellmer (Chapter 13, Zellmer, this book), the historical emergence of water quality protection came in part through interstate disputes over shared water bodies. The federal government protects interstate water quality through the Federal Water Pollution Control Act as amended in 1972 (commonly known as the Clean Water Act). In contrast, most disputes regarding interstate water quantity management continue to be resolved or prevented through equitable apportionment litigation in the U.S. Supreme Court and interstate compacts. Both legal approaches have been used in the Great Lakes, and some background on the evolution of the approaches is useful before looking specifically at the Great Lakes.

17.3.1 Equitable Apportionment

An important aspect of the American constitutional federal structure is the jurisdiction of the U.S. Supreme Court over suits by one state against another. American states are co-equal sovereigns, and the Supreme Court provides a forum for binding resolution of disputes between the states. Using this authority, the Supreme Court has, on occasion, allocated interstate transboundary waters. Its approach to interstate transboundary water allocation is based upon heavy reliance on the specific facts and circumstances, an approach termed 'equitable apportionment'. The need for equity in allocating transboundary waters was best stated by Justice Holmes in *New Jersey v. New York* (1931: 342–343):

> A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it. New York has the physical power to cut off all the water within its jurisdiction. But clearly the exercise of such a power to the destruction of the interest of lower States could not be tolerated. And on the other hand equally little could New Jersey be permitted to require New York to give up its power altogether in order that the river might come down undiminished.

This principle also comes from the Supreme Court's decision in *Kansas v. Colorado* (1907: 97–100):

> One cardinal rule, underlying all the relations of the States to each other, is that of equality of right. Each State stands on the same level with all the rest. It can impose its own legislation on no one of the others, and is bound to yield its own views to none. Yet, whenever … the action of one State reaches through the agency of natural laws into the territory of another State, the question of the extent and the limitations of the rights of the two States becomes a matter of justiciable dispute between them, and this court is called upon to settle that dispute in such a way as will recognize the equal rights of both and at the same time establish justice between them. … We must consider the effect of what has been done upon the conditions in the respective States and so adjust the dispute upon the basis of equality of rights as to secure so far as possible to Colorado the benefits of irrigation without depriving Kansas of the like beneficial effect of a flowing stream.

Through these and other decisions, the U.S. Supreme Court established that no single state can command an entire transboundary water to the detriment of other riparian states.

17.3.2 Interstate Compacts

Interstate compacts are powerful legal tools that serves as an alternative to litigation before the U.S. Supreme Court. A compact is like a contract between states entered into through state legislation. Because interstate compacts increase the power of the states at the expense of the federal government, they are subject to congressional approval and then have the full force and supremacy of federal law. This allows the terms of a compact to be enforced in federal court and prevents states from ignoring their compact duties (Hall 2006: 409–411).

Historically, substantive interstate water compacts have followed one of two models—western and eastern (Reflecting where the models are found; some interstate water compacts confer no substantive rights, merely providing a mechanism for sharing information and conducting joint research; see §17.5.). Western water compacts, such as the Colorado River Compact, focus on allocating the waters of a shared river among the participating states. These compacts divide the pie into agreed pieces, restricting the amount of water available to each individual state. These compacts do not, however, provide any standards or even guidance for managing individual water withdrawals within the state's total allocation (Hall 2006: 411–412).

The two major eastern water compacts, the Delaware River Basin Compact and the Susquehanna River Basin Compact, take a different approach (Dellapenna 2005: 831). They create centralized interstate management authorities comprised of the participating states and the federal government. These compact commissions have broad regulatory powers for permitting and managing individual withdrawals or diversions of all waters in the respective river basins. The commissions even set regional standards for discharges of water pollution (Dellapenna 2005: 845). This centralized approach has obvious benefits for uniform management of a single resource, but requires a significant surrender of state autonomy (Hall 2006: 412).

Regardless of the underlying approach employed by such compacts, the greatest shortcoming is the political challenge of getting a compact enacted (Hall 2006: 412–413). This requires ratification by each party state's legislature of identical compact terms and approval by a majority in both houses of Congress, which can modify the terms of the compact to protect national interests. The process also requires negotiation and compromise up front, as no state can unilaterally modify the terms of the compact during ratification. This process is a political obstacle course, and several recent efforts have failed for political reasons (Hall 2006: 412–413). Nonetheless, interstate compacts represent a cooperative approach to interstate water allocation and can be used to implement interstate water management policies.

17.4 The Chicago Diversion Litigation

Despite abundant water supply in the Great Lakes, the region has not been immune from interstate disputes over diversions. Litigation between states, with original jurisdiction in the US Supreme Court, is one method of resolving interstate water

disputes. The Chicago diversion litigation (a whole series of *Wisconsin v. Illinois* cases) provides an example of the role that this approach can play in transboundary water management.

In the early 1880s, Chicago was booming when an outbreak of chronic waterborne illnesses resulting from sewage disposal into Lake Michigan (the source of local drinking water) via the Chicago river threatened the health of residents (Hall 2006: 419–420). Chicago, therefore, built a canal to reverse the flow of the Chicago River, changing its outlet from Lake Michigan to the Illinois River, and ultimately to the Mississippi River and the Gulf of Mexico. The project was bold, controversial, and ultimately successful in protecting public health and linking the Great Lakes with the Mississippi River. Missouri, now downstream from Chicago's sewage, brought an interstate nuisance action in the Supreme Court, unsuccessfully challenging Illinois's discharge of sewage into the Mississippi River system as an interstate nuisance under federal common law (*Missouri v. Illinois* 1906; see Chapter 13, Zellmer, this book).

With Missouri's challenge overcome and Chicago's population and sewage increasing, the city increased the diversions from Lake Michigan from 72 m^3/s in 1900 to 241 m^3/s by 1924 (*Wisconsin v. Illinois* 1929: 404). That year, Wisconsin, Michigan, and New York (later joined by most other Great Lakes states) sued Illinois in the Supreme Court. The complaining states alleged that the Chicago diversion had lowered levels in Lake Michigan, as well as Lakes Huron, Erie, and Ontario, by more than 6 in., harming navigation and causing serious injury to the complainant states' citizens and property. Illinois's defence was premised on necessity and federal approval of the diversion, as well as a denial that the diversion caused any actual injury (*Wisconsin v. Illinois* 1929: 410).

Former Supreme Court Justice and Secretary of State Charles Evan Hughes was appointed by the Supreme Court as special master to review evidence and make recommendations. His report found that Chicago's diversion lowered the levels of Lakes Michigan and Huron by 6 in. and Lakes Erie and Ontario by 5 in., causing damage 'to navigation and commercial interests, to structures, to the convenience of summer resorts, to fishing and hunting grounds, to public parks and other enterprises, and to riparian property generally' (*Wisconsin v. Illinois* 1929: 407–408). The Court adopted this report, concluding that the reduced lake levels caused the complaining states and their citizens 'great losses' (*Wisconsin v. Illinois* 1929: 409). The Court rejected Illinois' defence of authorisation by Congress, concluding that the federal permit was merely a response to the public health threat and not a federal decision on management of the navigable waters of the Great Lakes.

While generally supporting the claims of the complaining states, the Court recognized the public health implications and economic costs that would come from halting the entire Chicago diversion. The Court referred the matter back to the special master for determination of the proper relief. The master's report recommended a phased reduction in the Chicago diversion, allowing the city time to build adequate sewage treatment. The Court adopted the master's recommendations and by 1939 the allowable diversion was limited to 42.5 m^3/s plus domestic pumping. Litigation continued for decades regarding Illinois's compliance with the ruling,

with the ultimate result being that the total allowable diversion was increased to 90.6 m^3/s, the level at which it is now capped (*Wisconsin v. Illinois* 1980: 48).

The Supreme Court apparently recognised that Great Lakes water management was less an issue of apportionment of water rights and more an issue of defining the bounds of the states' shared reasonable use duties. While the opinions do not advance this proposition directly, it is worth noting that the author of the primary Chicago diversion opinion (Chief Justice William Howard Taft) was the former President whose administration had negotiated the Boundary Waters Treaty. Taft, an Ohioan, may have instinctively appreciated that the abundance of Great Lakes water made allocation unnecessary and that the shared importance of the resource among two countries and ten states and provinces made protection of its values (navigation, drinking supply, fishing, recreation, etc.) critical.

The Chicago diversion litigation leaves two key legal legacies. First, the Chicago diversion, authorized at 90.6 m^3/s, remains the largest diversion of Great Lakes water out of the basin (International Joint Commission 2000). Second, while the Court's decisions stop short of absolutely prohibiting diversions, it prefers to protect the demonstrated interests of other states and preserve the integrity of the Great Lakes system. These legacies are an important part of the evolution of Great Lakes law.

17.5 The Great Lakes Basin Compact

The Great Lakes Basin Compact (1968) has not directly shaped the law of the lakes or had any substantive impact on water rights in the basin. It deserves brief mention because for several decades it was the only congressionally approved compact regarding Great Lakes water management, and it continues to provide a good example of information sharing interstate water compacts. Congress approved this Compact in 1968, although the Great Lakes states and provinces had negotiated it 2 decades earlier. It includes the eight Great Lakes states as members and creates a Great Lakes Commission comprised of representatives from the member states. It included a provision to allow Ontario and Quebec to join as parties, which Congress rejected. Nonetheless, Ontario and Quebec have recently joined the Great Lakes Commission as associate members (Hall 2006: 423).

The functions of the Compact and its Commission are limited to gathering data and making non-binding recommendations regarding research and cooperative programmes. The Commission can make advisory recommendations regarding 'uniform… laws, ordinances, or regulations relating to the development, use and conservation of the Basin's water resources. …', but 'no action of the Commission shall have the force of law in, or be binding upon, any party state.' This compact is characterised as typical of the 'we'll keep in touch' approach used in many interstate water compacts in the eastern United States (Dellapenna 2005: 838). Dellapenna notes that '[n]ot surprisingly, such a "let's keep in touch" approach failed to accomplish much toward protecting the biological, chemical, and physical integrity of the rivers and lakes addressed in the particular compacts' (Dellapenna 2005: 839).

17.6 The Great Lakes Water Quality Agreement

In the 1960s, citizens and scientists became increasingly alarmed about water pollution in the Great Lakes. The United States and Canada therefore referred the pollution issue to the International Joint Commission in 1964. The Commission report in 1970 recommended new water quality control programmes and the need for a new agreement on cooperation on pollution. In 1972, Prime Minister Pierre Trudeau and President Richard Nixon signed the Great Lakes Water Quality Agreement. This Agreement recognized the grave deterioration of water quality, setting forth general and specific water quality objectives, providing for programmes and other measures directed toward achieving water quality objectives, and re-defining the powers, responsibilities, and functions of the Commission. Primary responsibility for implementation was left with the two federal governments (specifically, the US Environmental Protection Agency and Environment Canada).

The 1972 Agreement focused on phosphorous pollution. Sewage treatment was improved and phosphate detergent bans were adopted in both countries. This success was tempered by new scientific discoveries and resulting public pressure to address persistent organic chemicals that 'were already affecting the health of wildlife and could be a threat to human health' (Botts & Muldoon 2005: 27). The United States and Canada amended the Agreement in 1978 (art. II) with a new purpose:

> [T]o restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem. In order to achieve this purpose, the Parties agree to make a maximum effort to … eliminate or reduce to the maximum extent practicable the discharge of pollutants into the Great Lakes System. Consistent with the provisions of this Agreement, it is the policy of the Parties that [t]he discharge of toxic substances in toxic amounts be prohibited and the discharge of any or all persistent toxic substances be virtually eliminated.

The Parties signed another Protocol in 1987 to add provisions for 'remedial action plans' for 'areas of concern' and 'lakewide management plans' focusing on critical pollutants and drawing upon community involvement. In 2006, the two countries and the International Joint Commission began conducting another comprehensive review of the Agreement to address emerging threats to the health of the Great Lakes.

Despite the Agreements' goals, their implementation has been undermined by their sub-treaty status (never subject to approval by the US Senate) and its lack of enforcement provisions. But while the Agreements have not been enforced in domestic court proceedings (*American Iron & Steel Institute v. Environmental Protection Agency* 1996: 1001) it has given citizens an increased role in shaping policy on pollution in the Great Lakes. Before the 1972 Agreement, the International Joint Commission held public hearings on specific topics, but essentially conducted its business in private. Under increased citizen pressure about the environment, the Agreement changed this custom and opened the Commission up to the public. The International Joint Commission (1998) affirmed its commitment to public participation in its *Ninth Biennial Report* in these words: 'The public's right and ability to participate in governmental processes and environmental decisions that affect it must be sustained and nurtured. … The Commission … has come to expect, and

to provide opportunities to be held publicly accountable for their work under the Agreement.'

The increased public participation in decision-making compensates, to some extent, for the Agreement's lack of enforcement provisions. With increased public participation comes increased accountability for the two federal governments, and the Agreement has helped to create an informed and engaged citizenry leading to improved binational protection of the Great Lakes. An important element in the public participation under the Agreement is the Science Advisory Board, which is comprised of scientists, citizens, and industry representatives. Originally called the Research Advisory Board, this body has a direct line of communication to advise the International Joint Commission. Despite its name, the Science Advisory Board has not limited itself to technical matters, and its work has led to many policy accomplishments (Botts & Muldoon 2005: 184–188).

17.7 The Great Lakes Charter of 1985

The Great Lakes Charter (1985) was signed by the eight Great Lakes states and two provinces, but not submitted to Congress for approval as an interstate compact. It contains potentially strong commitments and a cooperative process for Great Lakes water management, if fully implemented. As a non-binding agreement, however, it remains an aspirational policy with no legal effect. This Charter has three key components integrated throughout the agreement: (1) the commitment of the states and provinces to manage and regulate new or increased consumptive uses or diversions of Great Lakes water greater than 7,600,000l per day (1985: 8); (2) the commitment of the states and provinces to gather and report information on all new or increased withdrawals of Great Lakes water greater than 380,000l per day (averaged over any 30-day period) (1985: 8); and (3) prior notice and consultation with all the states and provinces for new or increased consumptive uses or diversions of Great Lakes water greater than 19,000,000l per day (1985: 4). If a state or province failed to adopt the promised regulations, it would lose its right to participate in the prior notice and consultation process. While not all states have fully met this regulatory commitment, they have met the information and reporting commitments. Yet poor compliance and under funded reporting programmes (primarily due to lack of political will) have caused a continued lack of data and information regarding Great Lakes water withdrawals.

The Charter's prior notice and consultation procedure could be characterized as a more specific version of 'we'll keep in touch' (Dellapenna 2005: 840). It provides that the state or province considering issuance of a permit for a new or increased consumptive use or diversion greater than 19,000,000l per day (averaged over any 30-day period) will first notify the offices of the other governors and premiers, as well as the International Joint Commission. The issuing state or province will then 'solicit and carefully consider the comments and concerns of the other

Great Lakes States and Provinces' (1985: 2). If necessary, a 'consultation process' will 'seek and provide mutually agreeable recommendations to the permitting State or Province' (1985: 4). The Charter does not provide a remedy if this consultation process proves fruitless or if one state persists despite others' objections. If the Charter's terms had been a binding and enforceable compact, it could have played a major role in achieving comprehensive water management of the Great Lakes.

17.8 The Water Resources Development Act (WRDA) of 1986

Congress joined the Great Lakes water management debate in 1986, enacting section 1109 of the Water Resources Development Act (1986):

> No water shall be diverted or exported from any portion of the Great Lakes within the United States, or from any tributary within the United States of any of the Great Lakes, for use outside the Great Lakes basin unless such diversion or export is approved by the Governor of each of the Great Lake States.

Thus, any Great Lake governors can veto a proposed diversion of Great Lakes water out of the basin. The statute also requires the unanimous approval of the governors before any federal agency can even study the feasibility of a Great Lakes diversion. Despite the statute's support state management of the Great Lakes, it suffers from numerous limitations that undermine its value. First, the statute contains no standards to guide the governors. Nor does it provide any judicial remedy to challenge a governor's decision, even by another Great Lakes state. There is no provision for citizen participation. These omissions may be explained by understanding the threat the statute was intended to address, namely proposed water diversions to other parts of the United States. The federal statute created a barrier to water diversions that would harm the region as a whole. The diversions that have actually been proposed since 1986 generally have been for uses within a Great Lake state but outside of the surface watershed.

Every Great Lakes state except Michigan has a significant portion (usually a majority) of their land and population outside of the watershed (where surface waters do not flow into the Great Lakes). Much of the resulting tension stems from the geographic fact that Michigan alone sits almost entirely within the Great Lakes basin. Thus, Michigan's governor can unilaterally stop any other Great Lakes state from diverting water within its own borders, but outside the basin, without concern for any reciprocal consequence. This is exactly what happened when Lowell, Indiana, located 4 mi from the Great Lakes basin divide, sought a diversion from Lake Michigan to replace local water supplies that suffered from unhealthy fluoride levels (Annin 2006: 142). This power discrepancy makes the federal statute politically vulnerable to repeal by Congress.

Further, the Water Resources Development Act (1986) is also limited by its narrow scope. It only applies to diversions out of the basin, not in-basin consumptive uses, and it does not apply to groundwater, which comprises over 15% of the total water supply in the Great Lakes basin (Grannemann 2000). These shortcomings are

particularly striking when compared with the Great Lakes Charter of 1985, which applies to both diversions and consumptive uses and to both surface and groundwaters. Nevertheless, the Act provides clear federal authority for opposing Great Lakes diversions. Congress had given the Great Lakes states a long leash, but it later encouraged the states to be more active and comprehensive in how they use their authority. Congress amended the WRDA (2000: §1962d-22) to include a policy:

> [T]o encourage the Great Lakes States, in consultation with the Provinces of Ontario and Quebec, to develop and implement a mechanism that provides a common conservation standard embodying the principles of water conservation and resource improvement for making decisions concerning the withdrawal and use of water from the Great Lakes Basin.

Congress did not condition the states' veto power on the success of implementing a standards-based management mechanism (such as a compact). Nor did it need to. The states' recognition of the flaws in the Act was evidenced in the subsequent amendment to the Great Lakes Charter—the Great Lakes Charter Annex (2001).

17.9 Annex 2001

The region's governors and premiers signed an Annex to the Great Lakes Charter Agreement in 2001. Popularly referred to as 'Annex 2001,' it reaffirmed the commitments in the Great Lakes Charter and contained a new commitment (Annex 2001: 1) to:

> [F]urther implement[] the principles of the Charter by developing an enhanced water management system that is simple, durable, efficient, retains and respects authority within the Basin, and, most importantly, protects, conserves, restores, and improves the Waters and Water-Dependent Natural Resources of the Great Lakes Basin. … [I]n order to adequately protect the water resources of the Great Lakes and [their] ecosystem, the Governors and Premiers commit to develop and implement a new common, resource-based conservation standard and apply it to new water withdrawal proposals from the … Great Lakes Basin. The standard will also address proposed increases to existing water withdrawals and existing withdrawal capacity from the … Great Lakes Basin.

To achieve these commitments, the Annex (2001: 2) provides a number of directives. The first is to develop 'Basin-wide binding agreement(s), such as an interstate compact'. Second, '[t]he Governors and Premiers commit to continue a process that ensures ongoing public input in the preparation and implementation of the binding agreement(s) called for in this Annex'. Third, Annex 2001 proposes the following principles for the new standards for reviewing water withdrawal proposals: preventing or minimizing basin water loss through return flows and implementation of environmentally sound and economically feasible water conservation measures; no significant adverse individual or cumulative impacts to the quantity or quality of the waters and water-dependent natural resources of the Great Lakes basin; improvement of the waters and water-dependent natural resources of the Great Lakes basin; and compliance with the applicable state, provincial, federal, and international laws and treaties. The governors and premiers further committed to developing a decision-support system and technical information regarding Great Lakes waters resources.

While non-binding, the commitments and principles of the agreement created much excitement within the region. The concept of return flow—requiring diverted water to be returned to its source—could protect the lakes from being depleted by exports. Establishing water conservation obligations in a region accustomed to abundance would be a major step toward sustainable water use. And protecting all water-dependent natural resources in the basin, not just the Great Lakes themselves, might address the many local impacts of water withdrawals around the region. The scope of the agreement also had great promise. The Annex applied to all water withdrawals, not just diversions. In a region that has focused only on threats of diversions and ignored the effects of its own water use, this was a tremendous advance. The Annex also recognized the interconnection of all waters in the basin, including groundwater. In the Great Lakes, as elsewhere, law and policy has been slow to recognize the surface water-groundwater connection and the need to manage all water conjunctively.

The most interesting and promising principle was the improvement standard. Most environmental and natural resource protection statutes are designed to protect the environment from increased harms. For example, the US federal policy for wetland conservation is 'no net loss'. In practice, this policy has allowed a slow but steady loss and degradation of natural resources. The improvement principle would change the existing paradigm, requiring improvement premised on the notion that limiting harm to an already damaged system is insufficient. Users of Great Lakes water must leave the resource better than they found it. The principle even holds potential for changing public attitudes toward water withdrawals. Individual projects would provide environmental benefits, not simply externalized costs. Over time, new projects would drive restoration of the Great Lakes ecosystem, not degradation of it. As with any new policy proposal, however, the improvement concept raises difficult questions: What exactly is an improvement? How much improvement would be enough to satisfy regulators? While the difficulty in answering these questions eventually undermined the improvement concept, the Great Lakes governors and premiers did meet their collective commitment to negotiate and draft implementing agreements. In late 2005, the international Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement was signed and the 3-year process of approval of the Great Lakes–St. Lawrence River Basin Water Resources Compact ended with President George W. Bush's signature in 2008.

17.10 The Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement and the Great Lakes–St. Lawrence River Basin Water Resources Compact

The Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement (2005) and Great Lakes–St. Lawrence River Basin Water Resource Compact (2008) ('Great Lakes Agreement' and 'Great Lakes Compact') represent an advance in

substantive legal rules for water use and cooperative management among the states and provinces sharing the Great Lakes basin. This section focuses on the Great Lakes Compact as a new model for interstate water management and the Great Lakes Agreement as a new model for sub-treaty international cooperation. To best understand the interstate and international management structures, it is important to first note the common standards (referred to as the 'decision making standard') for new or increased water withdrawals of Great Lakes basin water that are at the core of both proposals (Great Lakes Agreement 2005: §§201, 203; Great Lakes Compact 2008 §§4.9, 4.11): (1) All water withdrawn shall be returned to the source watershed less an allowance for consumptive use; (2) Withdrawals are to be implemented in a way that ensures no significant individual or cumulative adverse impacts to the quantity or quality of the waters and water dependent natural resources of the Great Lakes basin and the applicable source watershed; (3) Withdrawals will incorporate environmentally sound and economically feasible water conservation measures; (4) Withdrawals will ensure compliance with all applicable municipal, state, and federal laws as well as interstate and international agreements, including the Boundary Waters Treaty of 1909; (5) The proposed use is reasonable, based upon a consideration of the following factors: (a) Whether the proposed withdrawal will provide efficient use of the water, and will avoid or minimize the waste of water; (b) If a proposal is for an increased withdrawal, whether efficient use is made of existing supplies; (c) The balance between economic development, social development, and environmental protection of the proposed withdrawal and use and other existing or planned withdrawals and uses sharing the water source; (d) The supply potential of the water source, considering quantity, quality, reliability, and safe yield of hydrologically interconnected water sources; (e) The probable degree and duration of any adverse impacts expected to be caused by the proposed withdrawal and use under foreseeable conditions, to other lawful consumptive or non-consumptive uses of water, or to the quantity or quality of the waters and water dependent natural resources of the basin, and the proposed plans and arrangements for avoiding or mitigation of such impacts; and (f) Whether a proposal includes restoration of hydrologic conditions and functions of the source watershed.

These criteria are unremarkable as they are grounded in the common law riparian rights (the doctrine of reasonable use) prevalent in Great Lakes states and provinces (although the expansion of the criteria to groundwater withdrawals is notable). The criterion requiring compliance with all applicable laws, agreements, and treaties has significant importance, especially as the key bilateral agreements regarding water management suffer from a lack of enforceability and private causes of action. By requiring compliance with the Boundary Waters Treaty and other agreements, the Great Lakes Compact elevates their terms to enforceable standards for new or increased water withdrawals.

While the improvement concept did not become a requirement for new or increased water withdrawals, it was incorporated into the decision making standard. Improvements are not strictly required, but can be considered, under criterion 5(f), in determining the reasonableness of the proposed use. Water users can propose restoration as a way of making their water use more compatible with the policy

goals in effect. Finally, the compact indicates that the common decision-making standard is only a minimum standard. States may impose more restrictive standards for water withdrawals under their authority. Some jurisdictions already have permitting standards in place, and this ensures that the compact in no way requires a weakening of state regulatory programmes.

17.10.1 Management Under the Great Lakes Compact

For constitutional and political reasons (see §17.10.2), the Great Lakes Compact only includes the American states. It creates two separate approaches to managing new or increased water withdrawals in the Great Lakes basin, based on whether the water is used inside or outside of the Great Lakes basin surface sub-watershed boundary. Water used inside of the Great Lakes basin is managed solely by each state individually, with limited advisory input from other states for very large consumptive uses. Water used outside of the basin (a diversion) is subject to collective rules and approval processes, including a general prohibition on most diversions. This Compact requires the states to 'create a program for the management and regulation of New or Increased Withdrawals [for use within the basin]… by adopting and implementing Measures consistent with the Decision-Making Standard' within 5 years (Great Lakes Compact 2008: §4.10). The states must report to the Compact Council, which is comprised of the governor or delegated representative of each state, regarding their implementation. The Compact Council must review the state programmes and make findings regarding their adequacy and compliance with the Compact. The states must further develop and promote water conservation programmes and a water resources inventory including both available water resources and water withdrawals within the state. Diversions of water outside the Great Lakes basin are generally prohibited subject to exceptions for intra-basin diversions (lake-to-lake transfers within the entire Great Lakes basin) and diversions to communities that straddle the basin divide (Great Lakes Compact 2008: §4.9). Even if a diversion qualifies under one of the exceptions, it is usually subject to the unanimous approval of the eight Great Lakes governors voting as the Compact Council.

The Compact Council has numerous other powers and duties. It can promulgate and enforce rules to implement its duties under the Great Lakes Compact, plan, conduct research, prepare reports on water use, and forecast water levels. Perhaps most importantly, it can conduct special investigations and institute court actions, including enforcement. Citizens can also bring legal actions in the relevant state court against any water user that has failed to obtain a required permit or is violating the prohibition on diversions. The broad enforcement provisions are complemented by similarly progressive public participation provisions. The compact provides minimum procedural public process requirements for the party states and Compact Council, including: public notification of applications with a reasonable time for comments; public accessibility to all documents (including comments); standards for determining whether to hold a public meeting or hearing on an application; and allowing open

public inspection of all relevant records. The Great Lakes Compact also requires formal consultation with federally recognized Tribes in the relevant state. Such consultation is handled primarily through either the Compact Council or Regional Body (§17.10.2).

17.10.2 State-Provincial Cooperation Under the Great Lakes Agreement

State-provincial cooperation has been a regional goal for decades, implicitly promised by the Great Lakes Charter and Annex 2001 and expressly encouraged by Congress in its 2000 amendments to Water Resources Development Act. State cooperation with Canadian provinces has obvious ecological and policy benefits, but raises fundamental legal and political concerns. The Compact Clause of the US Constitution (I(10)) provides that '[n]o State shall, without the Consent of Congress … enter into any Agreement or Compact with another State, or with a foreign Power'. The same section also provides that '[n]o State shall enter into any Treaty, Alliance, or Confederation'. The limitation on states entering into an 'Agreement or Compact,' even with a foreign government, is limited only by the political decision of Congress to consent, but the prohibition on states entering into a 'Treaty, Alliance, or Confederation' is absolute. In an attempt to meet the goal of state-provincial cooperation without running afoul of constitutional treaty limitations, the Great Lakes Governors and Premiers developed the Great Lakes Agreement (2005) as a non-binding, good faith agreement that includes the provinces of Ontario and Quebec. This dual structure creates a legally and politically acceptable mechanism for cooperation with Canadian provinces.

The question of what constitutes a 'Treaty, Alliance, or Confederation' versus an 'Agreement or Compact' could open the door to major constitutional issues of separation of powers and federalism. For the Great Lakes, there is a sensible answer. Congress has already exercised its treaty powers through the Boundary Waters Treaty of 1909, making any attempt by states to enter into a binding management arrangement with the provinces on a related subject an impermissible treaty. Furthermore, if Congress approached an agreement with the provinces as a compact, it would likely reject either the entire compact or the inclusion of the provinces. This, after all, is what happened when the Great Lake states proposed including the provinces in the Great Lakes Basin Compact (1968) over 50 years ago (see §17.5).

While Congress might not allow a binding agreement between the states and provinces, its 2000 amendments to Water Resources Development Act expressed a desire for the states to work 'in consultation with' the provinces to develop a Great Lakes water management agreement (Water Resources Development Act 2000: §1962d-20(b)(2)). The states chose interpret this congressional encouragement not as permission to negotiate a compact with the provinces, but rather to develop a non-binding cooperative approach to Great Lakes water management that includes the provinces.

The Great Lakes Compact incorporates the provinces through the Great Lakes Agreement's 'Regional Body', comprised of representatives from each state and

province, and charges that body with responsibility to conduct the 'Regional Review' procedure. The Regional Body's authority is procedural rather than substantive; its determinations are advisory rather than final (Great Lakes Agreement 2005: §201). The Regional Body's role includes notice, consultation, and public participation, but stops short of final decision-making. The states and the Compact Council need only consider (but are not obliged to follow) Regional Review findings (Great Lakes Compact 2008: §4.7(2)). The Regional Review process is also limited to 'regionally significant or potentially precedent setting' proposals (as determined by a majority of the members of the Regional Body) and the exceptions to the prohibition on diversions discussed above.

The Regional Review process avoids infringing on federal treaty powers, but still gives the provinces an evaluative and procedural role that may prove useful for them. Despite the Great Lakes Agreement's non-binding status, Canada is generally pleased with the Great Lakes Compact and the Great Lakes Agreement. Canada's primary concern is that the United States, with significant population growth in the south and southwest far from the Great Lakes basin, will look to divert Great Lakes water to other parts of the country. Canada welcomes any legal limitations of Great Lakes diversions within the United States.

17.11 Conclusion

As demand for freshwater grows worldwide, transboundary waters will be under increasing pressure, leading to disputes over water rights and usage. In the past century, most transboundary water rights disputes were resolved by allocating access and use among competing parties. This approach did little to ensure protection of the transboundary freshwater ecosystem. It has also done little to ensure that the water is used sustainably. More recently, transboundary water management has focused on environmental protection and sustainable use—a result, in part, of a growing role for the public in managing transboundary waters. The evolution towards environmental protection and active citizen participation gives reason for optimism as climate change puts more pressure on freshwater resources in the twenty-first century.

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Chapter 18
The Río de la Plata Basin

Griselda D. Capaldo

Abstract This chapter scrutinizes customary practices and legal precedents on water management from the pre-colonial indigenous traditions to the present day, demonstrating the existence of a *corpus iuris aquarum ambientalis* applicable to the Río de la Plata basin. The *corpus iuris* stems from customary practices rooted in centuries old precedents and from regional and international duties of the five riparian states, four of them also being members of MERCOSUR. The chapter reviews the pre-Incan and post-Incan periods, the Spanish colonial phase, and current water law. It analyses whether the *corpus iuris* could resolve the controversial situation of the pulp mills factories on the Uruguayan bank of the River Uruguay, one of the main tributaries of the Río de la Plata. Because the River Uruguay demarcates the frontier between Argentina and Uruguay, the domestic legislation of both countries is also described and relevant South American case law is re-visited.

Keywords Customary water law • colonial water law • pulp mills • Río de la Plata • water management

18.1 Introduction

From early times, human beings have tried to understand, organize, and improve, not always successfully, their relationship with water and with water flowing in transboundary rivers. South America, with 28% of the world's renewable water available to 6% of the global population, is one of the world's richest regions in water, found in the Orinoco, Amazon, and Río de la Plata, and also in lakes, the Guaraní aquifer (named for the Guaraní Indians), smaller watercourses, and many glaciers. The management of this asymmetrically spread hydrologic network led to several agreements over time. This chapter first analyses the history of water

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management from pre-colonial times to the present and looks particularly at the evolution of water law in Argentina and Uruguay. It then examines regional water law principles and analyses the pulp mills case.

18.2 Water Law in South America Before the Nineteenth Century

In contrast to other regions, South America exhibits an interesting legal integration process because for centuries the Spanish colonies shared the same *corpus iuris*, the *Derecho Indiano*. This law brought together regulations on water uses, management, and diversion provided by old Spanish Law and by native communities (especially the Mayas and Aztecs in Mesoamerica and the Incas in South America). In other words, American aborigines' water governance was accepted by the conqueror as customary practices that had to be respected because of their effectiveness, sustainability and equity (Levaggi 2004). The following illustrates the sophisticated knowledge and practices relating to water and its use and management developed by indigenous peoples in South America.

18.2.1 Pre-Incan Cultures

In the pre-Incan period (500–1000 CE), the following two cultures are particularly noteworthy for their advanced water management practices.

Iglesia: Nearly 1,000 years before Columbus, a native people settled in Iglesia (in the current province of San Juan, Argentina) developed irrigation works based on huge stone cisterns about 40 m in diameter that collected water from streams to divert them to cultivated terraces by means of ditches. The size of the works allowed the retention of water for use during the winter droughts. The terraces were artificially depressed to depths of about 80 cm, whose bottom was covered with mud, manure, and wastes for fertility. The parcels were surrounded by an earth edge to avoid erosion and to make irrigation easier. Shrubs growing along the terraced edges maintained humidity and defended crops from dry winds from the Andes. This created a microclimate that retained diurnal heat and protected cultivation from cold temperatures at night (Brailovsky 2006).

Collaguas: A similar irrigation system, on which the Inca Empire was later based, was created and improved by Collagua Indians in the Colca valley (200 km from Arequipa, Perú). In this culture, one of the roles of *caciques* (Indian chiefs) was to distribute the land between different family groups in a public ceremony and to settle disputes between farmers. The 6,000 ha under irrigation, on terraced mountain slopes, made the Colca valley the main centre of food provision of Pre-Hispanic Perú. That is why in Perú *colca* currently means 'granary'. After 1,500 years of continuous use without soil erosion, these irrigated terraces remain productive and provide a stable economic base for the population (Sanz 1995).

18.2.2 The Incan Culture

Between 1200 and 1535 CE, the Incas built a vast Empire extending from the Pacific coast of Ecuador to the north of Argentina and Chile. When the Incas conquered other cultures, on which they imposed the payment of contributions, the first step was to send manufacturers and agricultural experts to the occupied territory to ensure that they could take advantage of the local knowledge and experience (e.g., the *collaguas*' agricultural practices). The little water available was totally used thanks to an ingenious water system through which rainwater was slowly filtered from the upper levels to the lower ones. Machu Picchu is a splendid example of an urban drainage system: Water reached public fountains through stone canals that were entirely covered to avoid pollution. Sewage waters flowed through other stone sewers. These were wider than the first ones and zigzagged to allow water oxygenation before emptying entirely purified in the sacred River Urubamba (Narváez 1885).

18.2.3 The Guaraní Culture

Since 1400 CE, *Guaraníes* have occupied vast areas of southern Brazil, Uruguay, eastern Argentina, and nearby lands in Paraguay. Their basic economic unit was the extended family, with 12 or 15 members living in a longhouse known as *tapui*. The family owned the agricultural fields and worked them communally (Metraux 1948). *Guaraníes* have two types of leadership: religious (*Paí*) and political (*Cacique*). The leaders direct production activities, food distribution, contacts with white men, the provision of justice, and management of internal problems. According to *Guaraní* tradition, they like to live in harmony with nature, and feel they are part of it. No sources of information are available about their precise rules for dealing with water resources except the oral tradition affirming that water use and management was and is to be sustainable.

18.2.4 The Colonial Period

Spain imposed a rich and complex political organization and legal system on Latin America from 1492 to 1800 CE. The Spanish legislation, such as *Fuero Juzgo*, *Fuero Viejo*, and *Fuero Real*, was mixed with the indigenous rules. The 1536 Provision, enacted by Carlos V and later incorporated into the *Recopilación de las Leyes de Indias*, established that water diversion and management should follow indigenous practices, the spirit of which relied on the equitable use and apportionment of waters and on the maintenance and cleanup of irrigation ditches (Martínez 1986).

The Hispano-America territories were politically divided by the Spanish conqueror into *virreynatos* (Viceroyalties). South America had two: the *Virreynato del Perú* and, after 1776, the *Virreynato del Río de la Plata*. The second occupied the

current territories of Argentina, Paraguay, Uruguay, Bolivia, and part of the south of Brazil. The *Virreynato del Río de la Plata* was divided into eight *Intendencias* (kind of provinces). Buenos Aires was the seat of the viceroyalty. The power centres of American colonies were the *Cabildos* (Town Councils), which exercised legislative, judicial and administrative powers. The *Cabildo* was the first Hispano-American body responsible for the care of the environment and of the administration of natural resources. Because *Cabildos* were the smallest political division, decision-making on environmental topics followed decentralized patterns.

Cabildos managed territorial planning, the harnessing of rivers, the cutting of forests, the conservation of livestock, the cleanliness and embellishment of the city, and the design and layout of roads and pluvial drainages (Cignolo 1982). By the eighteenth century, *Cabildos* were appointing a *Comisionado* (Commissioner) for controlling and regulating the use of irrigation ditches, for dividing water among users on the basis of 'economic' criteria, and for compelling people to repair and maintain public channels and ditches. Additionally, the *Comisionado* also had jurisdictional powers (Martínez 1986). From the nineteenth century onwards and until every South American country gained its independence, a General Court of Waters assumed the role of the *Comisionado* (Cano 1943).

A prosecutor was specially appointed to protect the native population's interests, such as Mr. Francisco Manuel de Herrera, who was involved in a noteworthy case involving deprivation of water use (Levaggi 2003). For centuries, two indigenous communities located in Aimogasta and Machigasta harnessed the water of a stream crossing the province of La Rioja (in Argentina). They paid taxes for their use to the Spanish King. In 1787, the head of Machigasta city expropriated a significant part of the lands on which the streams flowed, impairing the rights of indigenous people to water. The *caciques* from Aimogasta and Machigasta requested protection from the *Audiencia* (Court) de Buenos Aires. There, Prosecutor de Herrera defended native rights by advocating an annulment of the measure and restoration of the indigenous peoples' customary rights to water, as recognised by the *Recopilación de las Leyes de Indias*. The case lasted 13 years (from 1787 to 1800). The first judgement, announced in 1798, acknowledged the indigenous peoples' rights to free use the water of the stream and ordered the total restoration of the rights affected. The judgement was never executed because of political influences. Prosecutor de Herrera was transferred to the *Audiencia* de Santiago de Chile and a new judgement was announced in 1800 denying the aborigines' claims and declaring the validity of the property rights of the Spanish farmers on the fertile valley.

Finally, according to the Laws of *Castilla* and *Del Toro*, rivers were exclusive property of the Spanish King. This moved water management from the pre-colonial concept of free but equitable access to water to the model of the King's exclusive property rights. As a result, in 1543, the Río de la Plata was completely closed to alien shipping. It took more than two centuries to re-open the rivers through several bilateral Treaties.

18.3 Independent Argentina

This part is divided into two periods. The first period begins with independence from Spain. The second begins with the enactment of the federal Civil Code in 1869, the first attempt to legislate regarding some crucial water-related issues.

18.3.1 From 1810 to1869

Until 1869 local policies on water management were based on two different systems: (1) centralization based on provincial authority (e.g., Mendoza), and (2) decentralization through the delegation of power to municipalities (e.g., San Juan). On 15 October 1810, the province of Mendoza created the first *Juzgado General de Aguas* (General Water Court), dependant on the provincial executive power. The General Water Judge had administrative and jurisdictional competences, the first one related to construction, repairs, cleaning, and conservation of public works for irrigation, managing river waters for diversion into canals, licensing use of public waters, regularly verifying including inspections and investigations, and collecting taxes. This court still exists, but from 1872 onwards has been integrated into the judicial power. Nevertheless, its original administrative powers remain as part of governmental decision-making.

Water users formed irrigation societies, headed by a Canal Judge, to share expenses and to administer water rights, and to manage water. Judges were elected annually from among the owners of the irrigated lands. They depended directly on the General Water Court; a Consulting Commission helped them in the decision-making process. Jurisdictional competences were then organized in three levels: the first instance was the Canal Judge; the General Water Court was second; and the Judicial Chamber, the highest court. These bodies gave Mendoza province the most well developed water management system in Argentina. Water management relied on yearly concessions (later extended up to 6 years) entrusted to those who offered the best payment. After every auction, the rights and duties assumed by the concessionaire were: the repair, maintenance, and building of all necessary water-related public works; the expropriation of the lands indispensable for the development of works; the payment of severe fines if water supply was interrupted; and the collection of irrigation taxes from urban and rural water users. Individuals paid '*one real*' per hectare or per house, depending on whether they were farmers or city dwellers. The irrigation societies were entitled to choose between payments in cash or in kind, payment in kind consisting in repairing or cleaning ditches and canals (Cano 1943). This method, in addition to allowing people to save money, encouraged people to become more engaged in the sustainable management of the irrigation network.

18.3.2 From 1870 to 2007

In 1869 Argentina enacted the federal Civil Code, which is still in force. In the Code (as amended in 1967), *water* is defined as 'a material object susceptible of having value' (art. 2311). Additionally, the Code classifies water as part of the public domain because it is an element '[s]uitable to satisfy usages of general interest' (art. 2340). The Argentine Civil Code did not follow the reasoning of the 1804 French Civil Code with its emphasis on privatising water rights, but shifted the King's exclusive property rights to the State as the public owner of water.

Argentina is a federal country. Article 124 of the National Constitution, amended in 1994, vests the provinces with the original public domain of the natural resources within their territories. Article 41, however, states that the federal government will fix the minimum protection standards for natural resources and the provinces will establish the supplementary standards as necessary. Following article 41, between 2002 and 2004, the Nation passed the General Law on the Environment (Act 25675), the Law on Environmental Management of Waters (Act 25688), the Law on Integral Management of Industrial and Services Waste (Act 25612), the Law on Management and Elimination of PCBs (Act 25670), the Law on Free Access to Environmental Public Information (Act 25831), and the Law on Integral Management of Household Waste (Act 25916). We will only focus on the first two. Two laws in force before the constitutional amendment of 1994 introducing the environmental clause are also briefly discussed: Environmental Impact Assessment for Dams (Act 23879/90), and National Public Investments System (Act 24354/94).

From 1912 to 1990, the enforcement authority was *Obras Sanitarias de la Nación* (Water Supply National Company), which provided a drinking water and sewage system for the country. From 1990 onwards, as a result of Act 23696 on State reform, *Obras Sanitarias de la Nación* was dissolved and each provincial jurisdiction has its own enforcement authority whereas, at federal level, the enforcement authority is the Undersecretariat of Water Resources, whose action is supplemented by that of the Secretariat for the Environment and Sustainable Development.

The Act 25675 (art. 2) provides that national environmental policy should: (1) preserve, conserve, recover, and improve the quality of environmental resources, both natural and cultural, and its biological diversity; (2) promote the intergenerational principle; (3) foster social participation in the decision-making processes; (4) promote environmental education; (5) establish a federal system of interjurisdictional coordination; and (6) prevent and mitigate environmental emergencies and to remedy the damage caused by environmental pollution.

The Act (arts. 8, 19, 22, 28, 34) establish that the tools to achieve such goals are: environmental planning, impact assessment, environmental diagnosis and information systems, an economic regime of sustainable development, environmental insurance, and the creation of an Environmental Compensation Fund for each province. Environmental coordination between the provinces and the federal government is carried out through the Federal Council for the Environment created in 1990 and through the Federal Water Council, formed in 2003. According to

Act 25688, water basins are an environmental management unit (art. 3). It also creates Basin Committees for all the inter-jurisdictional basins (art. 4). The nation retains the right (arts. 7, 8) to determine the environmental standards and guidelines for water quality, design the National Plan for the preservation and rational use of waters, and declare that certain basins, aquifers, or areas are critical zones deserving special protection.

Act 23879/90 requires that the environmental impact assessment for dams takes into account the seismological, geological, hydrological, sanitary and ecological consequences of the work, the whole to be discussed in a public hearing. Act 23354/94 also requires that impact assessments for major works include, *inter alia*, the foreseeable demands for the use of other natural resources (such as fuel, water, etc.) and the assessment of effects on the soil, air, water, and climate, again subject to discussion in a public hearing. Additionally, the Autonomous City of Buenos Aires and each of the 23 provinces have enacted Waters Codes or Environmental laws that are consistent with those guidelines.

Finally, the National Constitution (art. 75.17) recognizes the identity and cultural pre-existence of Argentine indigenous peoples and guarantees their participation in the natural resources management that may affect their interests.

18.4 Uruguay

The legal history of water in Uruguay is also divided into two periods, with the *Código Rural* (Rural Code 1875), the first attempt to address water-related issues, as the dividing point.

18.4.1 From 1825 to 1875

The territory of Uruguay was part of the *Virreynato del Río de la Plata*. Its main city, founded in 1726, was San Felipe de Montevideo. Uruguay became an independent State in 1825. Similar to Argentinean colonial precedents, the coastal fringes by the rivers (*camino de sirga*) were reserved for public purposes and throughout the eighteenth century the establishment of large livestock-ranching activities consolidated the occupation of the territory, the empowerment of a new social class, and an economy based on high water-demand activities.

Meat-salting enterprises were the main stimulus for the industrialization of livestock products. In 1865 the Liebig Meat Extract Company of London opened a meat factory at Fray Bentos city on the River Uruguay to supply European armies. In the 1870s, Great Britain became the most important investor in Uruguay. In 1879, they gained control of water supply of Montevideo. Closure of the British meat-packing plant at Fray Bentos transformed it into a virtual ghost town. In 2002, the Uruguayan government approved the establishment of two mega pulp-mills in Fray Bentos.

18.4.2 From 1875 to 2007

Uruguay is a unitary country crossed by six water basins, four of which are transboundary basins, including the River Uruguay, which separates Uruguay from Argentina. The first regulation on the use of water for farming was the *Código Rural* (1875). It was replaced by the *Código de Agua* (Water Code, 1978 as amended in 1987 and 1991), supplemented by Acts 16466/94 on Environmental Impact Assessment and Act 17283/00 on Environmental Protection.

The Act 16466/94 (art. 2) addresses health, safety, or life quality, and aesthetic, cultural, or sanitary conditions, and the quality and diversity of natural resources. It defines (art. 6) the works that may cause negative or harmful environmental impact as including, among others, the main pipelines of wastewaters, works to exploit or regulate water resources, and the works that are designed to be built on the coastal protection strip.

The Act 17283/00, consistent with Uruguay's Constitution (art. 47), governs: the protection of the environment; the quality of the air, the water, the soil, and the scenery; the conservation of biological diversity and coasts; the protection of shared environmental resources; and sustainable development. It also enshrines the principles of prevention, foreseeability, precaution, and co-operation. It lays the foundations for the ecosystem approach in Uruguay. It contains (art. 10) a very interesting hermeneutic principle, which establishes that, when faced with two rules of the same hierarchy, the one with the stricter environmental standard is to be applied, no matter whether the source is a district or the nation. An amendment to the Uruguay's Constitution in 2004 (art. 47) provides that water is a natural resource essential to life and enshrines access to drinking water and sanitation as fundamental human rights.

The Water Code enshrines (art. 144) the principles of sustainable management of water resources, preservation of the hydrological cycle, and the unity of surface- and ground-waters, excluding rainwater. These waters are part of the State's public domain subject to the general interest. The Code is regulated by Decree 253/79, which includes (art. 2) a decisive interpretation clause, which provides that its rules on classification of water bodies, measures to prevent water pollution, pollution standards, and the discharge of effluents are applicable to all waters in Uruguay, notwithstanding 'International Law rules and the regulations contained in special laws'. In the author's opinion, through this rule, the hierarchy of international law on water is getting stronger, in a dualist country where international treaties have the same rank as the laws passed by national congress. A special provision of Decree 253/79 (art. 7) highlights the methodological guides, affidavits, the system of protected natural areas, and risk assessments, for which public hearings (art. 177) must be held.

The Ministry of Transportation and Public Works and the Ministry for Housing, Territorial Organization and Environment are the enforcement authorities. The *Obras Sanitarias del Estado* (State Water Supply Company), created in 1952, is included in the former and is in charge of the distribution of drinking water and drainage services in the whole country. Uruguay has also established Regional

Water Boards (Act 16858/97), composed of representatives of the State, individuals with water rights, and landowners.

18.5 Shared Waters, Shared Laws

With 3,100,000 km^2, the Río de la Plata Basin is the fifth largest river basin in the world. Its rivers form transboundary waterways shared by Argentina, Bolivia, Brazil, Paraguay, and Uruguay. The Río de la Plata results from the confluence of the Rivers Paraná, Paraguay, and Uruguay. It empties into the Atlantic Ocean. The basin contains 14 Ramsar sites, 9 Biosphere reserves, and 28 major national parks. It contains several mega-cities and towns along the riverbanks, concentrating more than 100 million inhabitants. Industry and agriculture make the area the most important economic motor in the region, but also have had adverse impacts on water quantity and quality. Environmental governance is the weak point of the five riparian States' decision-making.

Early in the twenty-first century, Uruguay authorized the construction of two huge pulp-mills able to produce almost 2 million tons of cellulose paste annually in Fray Bentos city. This project is to occur in a basin that has already been seriously compromised and thus became a serious dispute between Argentina and Uruguay. They submitted, in May and November 2006, respectively, a request for provisional measures to the International Court of Justice regarding the dispute. At Argentina's request, the dispute was subject to the good offices of the King of Spain between 4 November 2006 and 20 April 2007, when—through the Madrid Declaration—the States agreed to resume direct negotiations (suspended since March 11, 2006). An immediate outcome of the discussion was the relocation of the small Spanish pulp-mill near the Uruguayan city of Colonia. Because only the huge Finnish factory will remain in the original locality, the dispute between Argentina and Uruguay is now limited to Fray Bentos.

The following subsections discuss whether a set of binding environmental legal principles and customary law based on practices rooted in both pre-colonial and post-colonial precedents exist and the extent to which they constitute a consistent *corpus iuris aquarum ambientalis* applicable to water-related environmental issues, and whether that body of law can be integrated into the International Court of Justice's decision because they are the most suitable international legal framework applicable to the case.

18.5.1 International Water Law in the Americas

The First Pan-American Conference held in Washington (1889) endorsed the principle of utilising as much water as needed so long as there was no detriment to the interests of co-riparian States. Less than 50 years later, at the Seventh

Inter-American Conference, Argentina, Bolivia, Brazil, Paraguay, and Uruguay (the co-riparians of the Río de la Plata basin), joined other South-American and Mesoamerican countries to endorse the *Declaración de Montevideo* (1933). This non-binding document recommends that signatory States inform the other riparians before undertaking any study or work on an international watercourse. The coriparian is allowed to initiate a conciliation procedure through a joint technical commission to resolve a riparian dispute. If one of the parties refuses to join the process, the dispute should be settled by compulsory arbitration (Clagett 1961). Chile and Bolivia invoked the *Declaración* to settle the *Lauca* case, a river that rises in Chile and ends in Bolivia (Melo Lecaros 1963).

18.5.2 Multilateral Basin-Focused Instruments

From the *Declaración de Montevideo* (1933) onwards, the five riparians of the Río de la Plata basin have enforced environmental clauses in their Constitutions and entered into several international environmental treaties and regional water conventions, along with bilateral agreements on environmental cooperation and a set of declarations on transboundary rivers. These precedents make up a progressive development whose main steps are described in the following paragraphs.

The 1969 *Tratado de la Cuenca del Plata* (Treaty of the Río de la Plata Basin) La Plata Basin Treaty is the first agreement dealing with the harmonious, balanced development of the region and of the waters of basin. The States promise to preserve regional natural resources for future generations (preamble), to follow good neighbour practices (art. V), and to develop bilateral and multilateral agreements to further the goals of the treaty (which led to other treaties discussed in this chapter) (art. VI). The treaty creates (art. I) a basin-wide institutional framework to: promote programmes, studies, and works in areas of common interest; make rational utilization of water by multiple and equitable harnessing of the watercourse; preserve and foster wildlife; cooperate in education and sanitation; and maintain navigability. Its permanent agency is the Intergovernmental Coordinating Committee, composed of the Ministers of Foreign Affairs with decisions to be made unanimously (art. II(3)).

In 1971, the watercourse riparians endorsed the *Declaración de Asunción* on the Utilization of International Rivers, whose Principle 7 establishes that any work undertaken on the fluvial system of navigation of any international river shall preserve its natural resources and biota. In 1992, the *Hidrovía Paraguay–Paraná* Agreement was signed by the same five states. It creates a broad environmental mandate focusing on maintaining navigability and preserving and conserving the waters, human health, biota, and natural resources; and on exchanging data on water pollution, and on environmental legislation. The Intergovernmental Committee of *Hidrovía* was created to promote and oversee the development of this commercial waterway. The Agreement was included within the system of the 1969 Treaty. Nevertheless, the two Committees are run separately as distinct governing bodies. As there is no inter-agency contact, this feature is one of the weak points of the legal

system created by the riparians to manage the basin management (Capaldo 2005). More recently, four of the five Río de la Plata basin States joined MERCOSUR, including the MERCOSUR Framework Agreement on the Environment, expressly recognizing obligations to protect the environment, to promote public participation and environmental education, to enhance environmental cooperation by strengthening the observance of all matter-related treaties to which they are parties, to exchange information, and to harmonize their legislation and activities.

18.5.3 Argentine–Uruguayan Legal Instruments

Argentina and Uruguay entered into a series of agreements on the River Uruguay that culminated in the *Tratado de Límites del Río Uruguay* (Treaty of the River Uruguay) (1961), providing for joint exploitation and equal sharing of the waters of the Uruguay River. The two States also promised in 1961 (arts. 7, 8) to delimit the boundaries of in the river and to develop further a more comprehensive agreement on navigation, scientific research, conservation of natural resources, prevention of water pollution, and cooperation. They followed up in 1971 with *Declaración Argentino-Uruguaya sobre el Recurso Agua* (Argentine–Uruguayan Declaration about Water) reaffirming, *inter alia*, the principles defined in the *Declaración de Montevideo* (1933) and making its scope broader by spelling out their mutual legal obligations more specifically: equitable and reasonable utilisation of waters; preservation of ecological resources and avoidance of any pollution of international rivers and their tributaries; prior notification and consultation about any work concerning the water; the obligation to provide, within a reasonable period, technical reasons or studies supporting a claim that the reported project or programme will cause significant harm to its territory and any measures necessary to prevent such impairment; and the duty to submit any dispute to decision by a mixed technical commission.

Argentina and Uruguay entered into *Tratado del Río de la Plata y su Frente Marítimo* (Treaty Concerning the Río de la Plata and the Corresponding Maritime Boundary) in 1973. Besides many rules related to navigation, the treaty deals with environmental issues concerning: thorough and rational use of the resources of the bed and subsoil of the river in order not to cause significant damage to the other Party (art. 43); protection and preservation of the aquatic environment and its living resources and the prevention of river pollution (arts. 48, 54); liability for damage to the other party from pollution (arts. 51, 52); a general duty to cooperate (art. 52); the obligation to agree on fishing activities (arts. 54, 74–76); not causing significant damage to the other Party because of mining activities along the maritime lateral limit (art. 71); and peaceful settlement of disputes, by: (a) conciliation: any dispute shall be submitted to the consideration of the Administrative Commission of the Río de la Plata (arts. 59, 68); (b) direct negotiations: If the Commission is unable reach an agreement within a period of 120 days (art. 69); or (c) before the International Court of Justice if no agreement is reached within a period of 180 days (art. 87). The Administrative Commission (art. 66) and the Joint Technical

Commission of the Río de la Plata (art. 80) are empowered to assume many environmental functions.

In 1975, Argentina and Uruguay signed *Estatuto del Río Uruguay* (Statute of the River Uruguay), whose main environmental-related purposes are to: carry out an optimal and rational utilization of River Uruguay (art. 1); maintain its navigability (arts. 3–6); provide prior notification and consultation in order to give essential, operative, and technical details to the Administrative Commission of the River Uruguay about any work or project that may cause significant damage to navigation, the regime of the river, or the quality of its waters (arts. 7, 11, 49); allow inspection of works (art. 10); enable States to utilize, within their respective jurisdictions, the State's proper share of the water of the river for domestic, sanitary, industrial, and agricultural purposes, provided that the regime of the river or the quality of its waters are not affected (art. 27); ensure the informing of the Commission every 6 months about any utilization of the parts of river under national jurisdiction (art. 28); enable each State to explore and exploit the resources of the bed and subsoil of the river provided that such activities do not cause significant damage to the other Party (art. 30, 32); adopt the measures necessary to prevent significant damage to the regime of the river or the quality of its waters (art. 35); limit fishing activities (arts. 37–39); protect and preserve the aquatic environment (art. 41); compensate damage produced as a consequence of pollution caused by the other party (arts. 42, 43). Similar to comparable provisions of the 1973 treaty, the Administrative Commission of the River Uruguay is also empowered to assume directly many environmental functions. Disputes are to be settled by: (a) conciliation: any dispute shall be submitted to the consideration of the Administrative Commission of the River Uruguay (art. 58); (b) direct negotiations: if the Commission is unable to reach an agreement within a period of 120 days (art. 59); or (c) before the International Court of Justice if no agreement is reached within a period of 180 days (art. 60).

The 1973 treaty (art. 48) and the 1975 *Estatuto* (art. 41) both refer to observing and strengthening all environment-related treaties to which the States are parties as well as the environmental guidelines and recommendations of competent international organizations. In other words, the waters are to be managed and governed in conformity with a broader legal scope than that dealing only with transboundary watercourses, making relevant, for example, the many environmental treaties and bilateral environmental cooperation agreements adopted by the riparian States of the Río de la Plata basin in general and of the River Uruguay in particular (e.g., *Tratado sobre Medio Ambiente* (Environmental Cooperation Treaty, Argentina–Bolivia) 1994; *Acuerdo de Cooperación en Materia Ambiental* (Environmental Cooperation Treaty, Argentina–Brazil) 1996; *Acuerdo sobre Evaluación y Control de los Recursos Ictícolas y de la Calidad de las Aguas del Río Paraná* (Agreement on Evaluation and Control of Ichthyic Resources and of the Waters Quality of Paraná River, Argentina–Paraguay) 1989; *Acuerdo sobre las Normas Aplicables al Control de la Calidad de las Aguas del Río Uruguay* (Agreement on the Rules Applicable to Control the Waters Quality of Uruguay River, Argentina–Uruguay) 1977; *Convenio de Cooperación para Prevenir y Luchar contra Incidentes de Contaminación del Medio Acuático Producido por Hidrocarburos y Sustancias Perjudiciales* (Convention to Cooperate in Preventing Incidents of Water Pollution

by Hydrocarbons and other Harmful Substances, Argentina–Uruguay, 1987). The controlling principles include the principles of sustainable development, environmental cooperation, the exchange of data, the protection and preservation of ecosystems, the prevention, reduction, and control of pollution, the prevention and mitigation of harmful conditions, and the polluter-pays-principle.

18.5.4 Constitutional Provisions of the Basin States

Provisions enshrined in the Argentine, Bolivian, Brazilian, Paraguayan, and Uruguayan Constitutions support a common environmental approach. All of them have similar provisions on the defence, conservation, preservation, and restoration of the environment, but only the Argentinean and the Brazilian Constitutions enshrine the duty that present generations should not jeopardize the environments of future generations (Argentine Constitution: art. 41; Brasilian Constitution: art. 225; *see also* Uruguay Act 17283/00: art. 1(g)). Most of the constitutions include the obligation to compensate for and redress environmental damage (Argentine Constitution: art. 41; Brasilian Constitution: art. 225(1.I), 225(3); Paraguayan Constitution: arts. 7, 8; Uruguayan Constitution: arts. 47, 332) and the right of native communities to defend and preserve their habitats (Argentine Constitution: art. 75(17); Bolivian Constitution: art. 171; Brasilian Constitution: art. 129; Paraguayan Constitution: arts. 62, 63). Other constitutional provisions provide for environmental impact assessments (Brazilian Constitution, art. 225(1.IV) and the management of water resources (Argentine Constitution: arts. 26, 75(10), (18), 125; Bolivian Constitution: art. 136; Brasilian Constitution: arts. 176, 225(4), 225(5); *see also* Paraguay, Act 352: arts. 3, 16(h). Uruguay Act 17283/00: arts. 15 to 18).

18.6 The Pulp Mills Case

The Uruguay River, together with the Río de La Plata, forms the border between Argentina and Uruguay. *Oy Metsä-Botnia AB* from Finland and the *Grupo Empresarial Ence SA* from Spain are involved in the construction of two pulp mills factories on the bank of the River Uruguay, close to the Uruguayan cities of Fray Bentos and Colonia, respectively**.** Pulp will be exported for processing into paper at offshore locations in Europe, Asia, and other regions. The location of both plants was selected because of the proximity to wood supply sources, to international road networks, and to navigable waters. With an estimated yearly production of almost 2 million tons of pulp obtained by annually processing 4 million tons of wood, the projects would be among the world's largest of their type. For both factories, the Uruguay River will be the unique water supply and effluent receiver of the pulping process. Their construction was authorized by the relevant agency in Uruguay, the *Dirección Nacional de Medio Ambiente*, after the approval of a project-specific environmental impact assessment performed according to Act 16466/94 and

Decree 435/94. Nevertheless, Uruguay has recognized that there was no final environmental assessment in relation to the mills.

The Botnia plant is located across the river opposite the Argentine city of Gualeguaychú, an appealing tourist destination. As Botnia has been reluctant to give detailed information about the pulping process they use, Gualeguaychú's inhabitants have developed a great social environmental concern; Fray Bentos's residents have developed concerns to a lesser degree. Both are afraid of the prospective effects on the quality of the River Uruguay and on the areas affected by the river. In the conviction that Uruguay breached, *inter-alia*, obligations assumed under the *Estatuto del Río Uruguay* (1975) and other applicable rules of international law, Argentina filed an application before the International Court of Justice for indication of provisional measures against her neighbouring country on 4 May 2006. Uruguay also applied for provisional measures on 29 November 2006 to claim that the blockades of bi-national roads organized by Gualeguaychú residents should come to an end. In both cases, the Court declined to indicate provisional measures (International Court of Justice 2007). The Court did indicate that it was not prejudging any question relating to the admissibility of the applications or the merits themselves. The case on the merits is still pending, although in the Orders dated on 13 July 2006 and on 23 January 2007, the Court found that Argentina and Uruguay both failed to offer evidence of the injuries that the construction of the mills and the bridge-blockades by Argentinean demonstrators would cause to their economies, including the tourism and property sectors.

18.7 Conclusions

Scrutiny of the most relevant pre-colonial and post-colonial practices as well as the national and international documents related to the environment and to river management in South America, and particularly in the Río de la Plata Basin, confirms the existence of a legal and customary framework on water management whose consistency and observance for a long time forms a binding *corpus iuris aquarum ambientalis* for the five riparians of the Basin and, particularly, for Argentina and Uruguay as riparian States of the Uruguay River. That *corpus* is composed of the principles, rights, duties, and actions that have been repeatedly included in Constitutional clauses, domestic law, and international instruments or derive from customary practices. These include the following principles and duties: sustainability; prior notification and consultation for any works concerning an international watercourse; reasonable and equitable utilisation of waters and/or exploitation of natural resources related to the waters; preservation, protection, and conservation of water, natural resources, and biota, and of human health; cooperation and good neighbourliness; minimization, control, and prevention of water and environment pollution; exchange of data and information; maintain navigability; state responsibility for threat of damage to the environment from both its own activities and from those of individuals or legal entities acting within

its territory; avoidance of significant transboundary damage; the eco-system approach; preservation of the rights of future generations; peaceful settlement of disputes; observance and strengthening of all environmental treaties to which the States are parties as well as the environmental guidelines and recommendations of competent international organizations; and freedom of navigation along contiguous and boundary rivers.

The principles of sustainable, reasonable, and equitable utilization of waters, the eco-systemic approach, and environmental cooperation are rooted in pre-colonial practices observed by indigenous cultures as well as in contemporary customary international law. There is no doubt that Argentina has a legitimate interest in activities authorized by Uruguay, and *vice versa*, to the extent to which they may adversely affect the River Uruguay. In particular, this includes the potential impacts of industrial effluents, gas emissions, and wastewater discharges from pulp-mill into the shared-river, and the consequential adverse impacts for the land, economic interests, and fluvial areas of the Argentine riverside. Although the Parties have only based their claims on the *Estatuto del Río Uruguay* (1975) and on the 1961 Treaty defining the boundary on the River Uruguay between Argentina and Uruguay, a broader legal approach focused on other related national and international instruments and practices connected with the whole Río de la Plata Basin should be considered because: (a) The narrower view presented by both countries contradicts the eco-systemic approach indispensable to find solutions to emerging environmental problems; (b) The narrower view implies putting aside the River Uruguay as part of the Río de la Plata Basin, and consequently to separate the river from the drainage basin as a unity as defined by the UN Convention on the Law of Non-navigational Uses of International Watercourses (1997: art. 2(a)): ['W]atercourse' means a system of surface waters and groundwaters constituting, by virtue of their physical relationship, a unitary whole and normally flowing into a common terminus', and by the Berlin Rules (2004: art. 3(5)): ['D]rainage basin' means a geographical area determined by the topographic limits of a system of interconnected waters, the surface waters of which normally share a common terminus; for purposes of these rules, an aquifer constitutes all or part of a drainage basin regardless of whether it receives significant contemporary recharge'; and (c) The narrower view forgets that, in dealing with international river management, Argentina and Uruguay have endorsed, through two bilateral treaties and a multilateral agreement, the obligation to enact and strengthen the observance of all environmental-related treaties to which they are parties as well as those environmental guidelines and recommendations of competent international organizations.

In summary, a consistent *corpus iuris aquarum ambientalis* emerges as being a solid platform that should be taken into account to settle the dispute between Argentina and Uruguay regarding construction of a pulp mill in Fray Bentos city on their boundary river—a body of law sustained by the riparian States for more than 7 decades.

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Part IV
Current Trends in International Water Law

Chapter 19
Case Law on International Watercourses

Lilian del Castillo-Laborde

Abstract States have turned from negotiations to other means for resolving international controversies over water. They moved from technical reports of mixed commissions to arbitration to international courts. Arbitration is more independent than technical commissions, but is limited in its competence and procedures. International adjudication requires permanent international courts, principally the International Court of Justice. Because the Court relies on its precedents and is consistent in its holdings, the few disputes over water have produced controlling case law. Arbitration and judgments have a reciprocal influence with international custom and treaties in the creation of law. A systematic enquiry into the relevant arbitral awards and court judgments discloses trends and the effectiveness of adjudication.

Keywords Arbitration • international courts • judgments • navigation • technical commissions • water disputes

19.1 From Negotiation to Adjudication in Dispute Settlement

International adjudication has included issues relating to water institutions and the norms of international law that govern access to and use of water resources. States turned from negotiations to other peaceful means to resolve international controversies through recourse to technical information and the interpretation of international law rules. The path to solutions grounded on legal sources went from the technical reports of mixed commissions that resembled mediation to decisions by international tribunals. Between commissions and courts lies arbitration—more independent than technical commissions because the decision-makers are of a nationality different

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from the parties, but limited in competence and procedures. Arbitration, after all, is a creature of contract. Arbitration can be traced back to ancient times, and the same is true of water institutions, international, national, and local.

Today, besides arbitration, States have recourse to permanent international courts, beginning with the Permanent Court of International Justice established by the League of Nations in 1920. The International Court of Justice is its successor and is the principal judicial organ of the United Nations and the oldest permanent tribunal of the international community. The main judicial systems and geographical regions of the world are represented in the Court, whose judges enrich their decisions with their different cultural and legal backgrounds. The sources of legal thought embodied in the decisions of the World Court consolidate and nurture international law and influence national legal systems as well. Because the Court relies on its precedents and is consistent in its holdings, the few relevant disputes on water issues have created controlling case law. In 1920, the Permanent Court issued its first Advisory Opinion concerning international watercourses, regarding the *Jurisdiction of the European Commission of the Danube,* and in the docket of cases before the International Court of Justice in 2008, three cases deal with river issues: The *Gabcíkovo-Nagymaros Project Case* (1993) (still pending following the decision on the merits because of a request for an additional judgment), and two other cases brought before the Court: *Dispute Regarding Navigational and Related Rights* (2005) and the *Pulp Mills on the River Uruguay Case* (2007); (see Chapter 18, Capaldo, this book). Arbitral awards and judicial decisions have a reciprocal influence on international custom and treaties in the creation of law (Allain 2000: 14–15). The general rules developed by the international tribunals go beyond the circumstances of a particular dispute and permeate international law. A systematic enquiry through selected cases discloses trends and the effectiveness of adjudication.

19.2 Decisions Shaping International Watercourses Law

During its brief existence, the Permanent Court of International Justice had the opportunity to decide several cases on international river management that crystallized the controlling legal principles. In the *River Oder Case* (1929), the Permanent Court concluded that there is a 'community of interests of riparian States' that, in a navigable river, 'becomes the basis of a common legal right'—a rich concept that forms the basis for a duty of cooperation for international navigable rivers. The 'community of interests' entails a 'legal partnership', imposed by nature and acknowledged by law. Persistently quoted, the recognition of this equitable principle contributed a new approach to navigable international watercourses in particular and to natural resources in general. The Court also applied the rule of 'freedom of navigation for navigable watercourses' in the *Oder* case. Both freedom of navigation and the community of interests of riparian States were brought to the fore by the Court and repeatedly endorsed since.

The International Court of Justice, in its decision on the *Gabčikovo-Nagymaros Case* (1997), recalled the decision of its predecessor and stated that the '[m]odern development of international law has strengthened this principle for non-navigational uses of international watercourses as well'. The position of both Courts confirmed that the legal rights and obligations of States riparian to international rivers include its tributaries and sub-tributaries and the navigable and non-navigable uses of the international watercourses. The legal right is premised on 'the perfect equality of all riparian States in the use of the whole course of the river and the exclusion of any preferential privilege of any one riparian State in relation to the others'. Equality in use does not mean equal shares but an 'equitable share'. Equality of rights encompasses the duty to cooperate between riparian States, an obligation the Court also recognised in the *Gabčikovo-Nagymaros Case*. For States riparian to international watercourses to refuse cooperation entails a failure to comply with a legal duty. The 'community of interests' implies moreover the duty to cooperate in the management of international waters, a realm broader than international watercourses, which in turn implies the responsibility of States for the environmental effects of their uses.

Both courts and arbitral tribunals have addressed the right to equitably use shared waters. The Permanent Court of International Justice, in its decision in the *Diversion of the Meuse River Case* (1937), held that each State is entitled to manage, in line with its requirements, the water resources within its territory, provided that its utilisation has no adverse effects on uses in other riparian countries—recognizing the two rules that are cornerstones of the legal principles governing internationally shared waters. A sharing of benefits is implied in the right to utilise the water in the territory of each riparian State. In the *Gabčikovo-Nagymaros Case* (1997: ¶85), recognized a riparian State's 'right to an equitable and reasonable share of the natural resources of the Danube', taking due account of the 'proportionality which is required by international law'. Proportionality, implying an equitable and reasonable share, allows a tribunal to balance overlapping needs when the available resource is insufficient to satisfy all competing demands. The Court thus recognized that the equitable principle of proportionality is also embedded in the legal principle of equitable utilisation.

The legal principle of equitable utilisation implies the substantive obligation to take into consideration the different interests at stake and the aim to conciliate those interests. Concomitantly, the rights to utilise the waters and to share the benefits are limited by corresponding duties. The rule of 'no harm to other riparians' becomes part of the rule of equitable utilisation as a corollary of the principle of equitable utilisation and of the 'community of interest' of international rivers recognized by the courts. That rule also implies the duty to give notice of proposed activities to other riparian States, although it does not indicate the obligation to obtain the agreement of the notified State (*Lake Lanoux Arbitration* 1957). Another corollary is liability and reparation when harm occurs, as was confirmed in the *Gut Dam Case* (1968), where reparation was due even though the use had been authorized by the other riparian State. The abovementioned cases will be reviewed to illustrate the circumstances and the reasoning in which those principles were formulated.

19.2.1 Jurisdiction of the International Commission of the River Oder (1929)

The Treaty of Versailles (1919) provided that certain rivers or stretches of rivers would be international. The River Oder was made subject to an international commission to regulate navigation, fix and collect tolls, and carry out works to maintain and improve the waterway. The Oder Commission had to 'define the sections of the river or its tributaries to which the international regime shall be applied'. Poland interpreted the competence of the Commission as ending at the Polish boundary, but other members asserted that 'if the principle of the internationalization of tributaries was to be adopted, it must be integrally maintained' and thus that the Commission had jurisdiction over the Polish navigable stretches.

The participating States asked the Permanent Court of International Justice in 1928 to decide whether the jurisdiction of the Commission extended to the Warthe (Warta) and Netze (Noteć), tributaries that were within Polish territory, and if so, what principle determined the upstream limits of the Commission's jurisdiction. The Court focused its decision on Article 331 of the Treaty of Versailles, which addressed 'all navigable parts of these river systems which naturally provide more than one State with access to the sea'. The Court drew a distinction between international rivers and national rivers, defining an international river as one that satisfies two conditions: that the waterway be navigable; and that it naturally provides more than one State with access to the sea. The Court indicated that when a waterway traverses or separates the territory of more than one State 'it is at once seen that a solution of the problem has been sought not in the idea of a right of passage in favour of upstream States, but in that of a community of interest of riparian States'. It added a remarkable statement: 'This community of interest in a navigable river becomes the basis of a common legal right, the essential features of which are the perfect equality of all riparian States in the use of the whole course of the river and the exclusion of any preferential privilege of any one riparian State in relation to the others'. The Court relied for its opinion on different conventions, especially the Final Act of the Congress of Vienna (1815: arts. 108, 109), which declared that there shall be freedom of navigation in rivers that separate or traverse different States, with freedom to trade applying to anybody 'from the point where they respectively become navigable to their mouths'.

19.2.2 Diversion of Water from the Meuse/Maas (1937)

The River Meuse (Belgium), or Maas (The Netherlands), is an international river 950 km long, flowing from France into Belgium and debouching in the Netherlands through several branches to form a common delta with the Rhine. In 1863, Belgium and the Netherlands signed a treaty with the purpose to

regulate, in a permanent way, the diversion of water from the River Meuse to feed the navigation and irrigation channels. The implementation of the Treaty was successful until increasing trade made new and better canals necessary. The Netherlands built the *Juliana* canal, constructing a new lock and another barrage, and Belgium built the Albert Canal from Liége to Antwerp, a broad canal of 125 km in length, and reconstructed and improved connecting canals. The Netherlands filed an Application before the Permanent Court of International Justice in 1936, contending that Belgium's new canal would be supplied with water diverted from the Meuse, contrary to the provisions of the 1863 Treaty, and asked the Court to order Belgium to discontinue its construction. Belgium responded that the proper implementation of the Treaty was made impossible by the unilateral works carried out by the Netherlands, and asked the Court to declare the 1863 Treaty terminated. The Court considered that the 1863 Treaty did not prevent the Parties from modifying, enlarging, or transforming the canals in their own territories if they did not affect the discharge of water from the Meuse intake and that there were no provisions forbidding the Netherlands from changing the depth of the water after it passed out of Belgium.

The Court thus rejected the claims of both Parties. Dissenting opinions by two judges found there were legal grounds to validate some of the submissions. Judge Manley O. Hudson, while aware that the question remained unsolved, stressed that the Court would 'better serve to facilitate their future negotiations if it preserves the equality between the Parties'. The Parties negotiated a settlement whereby the Albert Canal, from the River Meuse to the River Scheldt and the port of Antwerp, was finished in 1939 and has operated ever since.

19.2.3 Lac Lanoux/Lago Lanós (1957)

Lake Lanoux is located in France, in the département of Pyrenées Oriental of the Cerdagne region. It is fed by streams that have their source in the French Pyrenées, but its discharge flows into Spain through the Carol River which joins the Ségre River, a tributary of the Ebro. France and Spain entered into a specific agreement on the regulation of their shared water resources, the Treaty of Bayonne and Additional Act (1866), which establishes the rights and duties of the upper and downstream users. Since 1917, the French government has studied different projects to improve the use of the waters of Lake Lanoux, implying the diversion of waters to the Ariège River, a tributary of the Garonne River, which flows into the Atlantic Ocean. In 1956, the states agreed to submit the interpretation of the pertinent provisions of the 1866 Treaty to arbitration to decide whether France needed a prior agreement with Spain before undertaking the planned works.

In its 1957 award the Tribunal recalled the reasoning of the Permanent Court in the *Diversion of water from the Meuse* case, where the Court discarded the application of 'general rules of international law as regards rivers,' and decided to take into account the spirit that guided the Parties to enter into the Pyrenean Treaties as well

as the rules of general international law. The Tribunal was of the opinion that the diversion with restitution, as envisaged in the French scheme, was not contrary to the 1866 agreements. The Tribunal asserted that each river basin is 'a unit' but at a juridical level this unit should be construed in relation to human realities.

The tribunal found that international practice at the time did not establish, as a customary rule or a general principle of law, that States may utilise the hydraulic power of international watercourses only on condition of a prior agreement between the interested States. The award relied on the provision of the 1923 Geneva Convention on the Development of Hydraulic Power Affecting More than One State that 'in no way alters the freedom of each State, within the framework of international law, to carry out on its territory all operations for the development of hydraulic power which it desires' (Article 1). The prior agreement is then a conventional and not a customary duty, and from the applicable treaties stems the obligation to give notice which does not include the obligation to obtain the agreement of the State that has been notified. Otherwise, it would imply the impossibility of exercising the State jurisdiction whenever there was a dispute. Furthermore, although France was entitled to exercise its rights, Spain was entitled to demand that its rights be respected. According to the circumstances, the Tribunal asserted that the French project complied with the obligations included in Article 11 of the Additional Act. Therefore, the French government was not committing a breach of its international obligations in carrying out the works for the utilisation of the waters of the Lake Lanoux in the conditions described in the Scheme without prior agreement with the Spanish government.

19.2.4 Gut Dam (1968)

The United States brought claims on behalf of its citizens for damages from the construction and operation by Canada of a dam in the international stretch of the St. Lawrence River. The United States had consented to the dam by a statute enacted in 1902. The Gut Dam was then built and in 1904, also with the consent of the United States, it was made higher. The dam and other works raised the level of Lake Ontario and the St. Lawrence River. The level reached unprecedented heights in 1951 and 1952 and produced flooding and erosion on the shores of the lake and river. Canada and the United States had established the International Joint Commission by the Treaty Relating to Boundary Waters and Boundary Questions (1909), and in 1952 the two States asked the Commission to study the factors affecting the Lake Ontario water levels. In 1952, a large number of affected property owners in the United States sued Canada in the U.S. District Court for the Northern District of New York. The Gut Dam was demolished in 1953 as part of the construction of the St. Lawrence Seaway. In 1956, the suits were rejected due to ineffective service of process (*Oster v. Dominion of Canada* 1956). Following extensive negotiations, the Canadian and U.S. Governments established the Lake Ontario Claims Tribunal in 1965 to which landowners were entitled to compensa-

tion, as Canada agreed to pay compensation only for the damages resulting from the construction and operation of the dam (Lillich 1965: 897–898). With the agreement of the States, the Tribunal applied equity as the applicable rule instead of existing agreements of difficult interpretation. The Tribunal held the Canadian government liable and ratified a compromise whereby Canada paid a lump sum of U.S. $350,000 for the United States to distribute among the claimants as final settlement of all claims supposed to be caused by the Gut Dam (*Gut Dam* 1968: 140–141). The lump sum agreement, however, neither determined the link between the damages and the construction of the Gut Dam nor the responsibility of the riparian States for the construction and operation of works in boundary water bodies.

19.2.5 The Gabcíkovo-Nagymaros Project (1997)

This case, which was decided by the International Court of Justice in 1997 but has not yet been closed, arose between Hungary and Slovakia regarding a project on the Danube River. The project had been authorized by agreement signed in 1977 between Hungary and the former state of Czechoslovakia (on 1 January 1993, Slovakia and the Czech Republic became separate States). It was intended to produce hydropower, benefit navigation, regulate water flow, and control floods. The plan foresaw the construction of several works, including dams, locks, and additional infrastructure, in the stretch of the Danube between Bratislava and Nagymaros.

In a new political setting after the end of Communism in 1989, Hungary suspended construction on the works in its territory that were part of the project on the grounds that they cause significant environmental damage. Hungary sought to terminate the 1977 Treaty. Slovakia, the successor State for the 1977 Treaty, continued the project and made an additional dam at Čunovo, allegedly made necessary by the Hungarian decision. In 1993, the two States submitted their differences to the International Court of Justice, asking it to decide whether Hungary was entitled to suspend and then abandon the works on the Nagymaros Project and whether Slovakia was entitled to proceed with its 'provisional solution', and to determine the legal consequences of these decisions.

Hungary argued that the suspension of the works on its territory was necessary because of a 'state of ecological necessity' that would result from the dams and locks on its territory. The Court rejected this contention because there was no evidence of a grave or imminent peril and 'the dangers ascribed to the upstream reservoir were mostly of a long-term nature' and remained uncertain (*Gabcíkovo-Nagymaros Project*: ¶55). Starting from the premise that 'the Danube is not only a shared international watercourse but also an international boundary river', the Court decided that the operation of another plan by Czechoslovakia/Slovakia also violated the treaty (¶78). Even as a countermeasure, it was not acceptable; the Court resorted to the concept of 'community of interests' of riparian States of international rivers elaborated in the *River Oder Case* and reaffirmed that the '[m]odern development of international law has strengthened this principle for non-navigational

uses of international courses'. The Court turned to the UN Convention on the Non-navigational Uses of International Watercourses (1997) as evidence for this claim (¶¶78, 85, 141).

The Court thus found that both Hungary and Slovakia had breached their legal obligations (¶155). Hungary was not entitled to suspend and abandon its works and Slovakia was not entitled to put the 'provisional solution' into operation. The Court concluded that the unilateral termination by Hungary of the 1977 Treaty was not legally effective. The Court imposed on the Parties a duty to 'negotiate in good faith' and recommended both countries to agree on a joint operational regime as foreseen in the Treaty, which was still in force. Damages occasioned by the violations on each side were to be compensated. There were seven dissenting opinions among the 15 judges. Further negotiations between the Parties did not succeed and on September 1998 Slovakia presented a request for an additional judgment based on the unwillingness of Hungary to implement the Judgment and asking the Court to determine the modalities for executing the Judgment. There has been no further proceedings in the case so far.

19.3 Water Management

Broadly speaking, water management involves both water quality and water quantity aspects. Although these aspects are closely interrelated, States and tribunals have generally treated them as separate. This section examines a series of decisions that have addressed each of these aspects. Freedom of navigation issues are treated in the following section.

19.3.1 Water Quantity Allocation

The distribution of water and its allocation among riparian States is a difficult topic to negotiate because it often involves a situation where water is insufficient to satisfy regional needs. Decisions regarding the Helmand River (which flows from Afghanistan into Iran), the Kushk River (between Afghanistan, present Turkmenistan, and Russia), and the Zarumilla River (between Peru and Ecuador) are good examples. The latter two cases, the former of which is still used as a reference and the latter because still in force, prove that arbitral decisions can successfully settle the allocation of water flow.

19.3.1.1 The Helmand (Hirmand) River Basin (1872)

The Helmand River rises in the Hindu Kush ridge in Afghanistan, 35 mi west of Kabul, and flows for 1,100 km to the southwest of the country; it does not flow to the sea, but pours its waters into lakes and wetlands. In wet periods, it floods a vast area,

but for a great part of the year it is dry or merely a swamp. Downstream, the river divides itself into two branches, one along the boundary between Afghanistan and Iran that debouches in several lakes in Afghanistan and Iran. The other branch ends in three interconnected lakes in the Sistan area of southeastern Iran and southwestern Afghanistan. The Sistan region's extensive wetlands were dried by the construction of dams in the upper stretches of the Helmand and other rivers from the Hindu Kush.

A dispute between Afghanistan and Persia (Iran) concerned the delimitation of their boundary and the use of the waters of the Helmand River in the Sistan wetlands. A British arbitrator held in 1872 that Persia did not possess land on the right bank of the Helmand and that both banks of the Helmand above the Kohak Dam was in Afghanistan, although no works were to be carried out on either side that could interfere with the supply of water for irrigation on the banks of the Helmand. Both governments accepted the award, but demarcation caused additional controversies. Another arbitration between Afghanistan and Persia in 1888 was also accepted by the Parties (Darby 1904: 808). Yet another award was rendered in 1905, making it clear that Sistan suffered more from excess than deficiency of water and accordingly allocated flows for Persia and left enough supply for Afghan requirements as well, stating that '[n]o irrigation works are to be carried out on either side calculated to interfere with the requisite supply of water for irrigation on both banks of the river, but both sides have the right, within their own territories, to maintain existing canals, to open out old or disused canals, and to make new canals, from the Helmand River, provided that the supply of water requisite for irrigation on both sides is not diminished'. The arbitrator added that 'the rights to the Helmand river which its geographical position naturally gives to Afghanistan as owner of the Upper Helmand, have been restricted to the extent stated above in favour of Persia', which has no right to alienate to any other power the water rights thus acquired without the consent of Afghanistan'. Notwithstanding its equitable grounds, the award was not accepted by Persia and Afghanistan. Finally, in 1950, Iran and Afghanistan, with the good offices of the United States, agreed to establish the technical Helmand River Delta Commission in order to cooperate in the allocation of the water of the Helmand River for Iran and Afghanistan (Legislative Texts 1963: 270), but in the end no agreement was reached.

19.3.1.2 The Kuskh River (1893)

The decision of 3 September 1893 by a Commission established to interpret boundary protocols dealt with the use of the water between Afghanistan and Russia. The River Kushk (Kushka or Koshk) flows down from northwestern Afghanistan and becomes a boundary river with the current Turkmenistan, then part of the Russian Empire. By a protocol of 10 September 1885, Great Britain and Russia established the Kushk River as the boundary between Afghanistan and Russia. They agreed that the boundary follows the *thalweg* and that Afghanistan will not be able to take water from that stretch of the Kushk but they shall have the right to make use of the other branches to irrigate their lands (Kushk River 1885: 568–569).

19.3.1.3 The Zarumilla River (1945)

In 1942, through the good offices of Argentina, Brazil, Chile, and the United States, Ecuador and Peru entered into the Protocol of Peace, Friendship, and Limits, which defined the boundaries of the two countries along the Zaramulla River. The Protocol was the final stage of a large territorial dispute between Ecuador and Peru from the earliest days of their independence in 1830, which had produced an outburst of armed confrontations in 1941. The region through which the Zarumilla River flows was a disputed area between both countries and in 1945 both countries accepted an arbitral award by Brazil, which traced the boundary line according to the limits established in the 1942 Protocol (McBride 1996). Regarding the 'Zarumilla Sector', the Brazilian Memorandum establishes the *thalweg* in a canal between the different islands as boundary and Peru committed itself to build the canal and to make part of the waters of the Zarumilla run along the old bed, ensuring Ecuador the co-ownership (*condominio*) of the waters under international practice (McBride 1996: 231–237). In 1998, both countries negotiated the Treaty of Trade and Navigation and established Regulations to administer the Zarumilla canal and its waters. The Regulations establish that the flow of the canal shall be distributed in such a way as to let Ecuador use 55% of the total available water and Peru 45%, a proportion that also applies to groundwater. Reconstruction and cleaning works have also been carried out in the Zarumilla canal (Los documentos de la paz 1998).

19.3.2 Water Quality Protection

Water quality protection is a relatively new issue in international adjudication. Environmental concerns grew worldwide as the international society becomes aware of the threats to natural resources and the harmful effects of environmental degradation on humans. Adjudications on the matter are constructing case law in national courts while they are beginning to appear in the dispute settlement mechanisms of international bodies, such as the World Trade Organization and the European Union Human Rights Court. In the 2004 *Protection of the Rhine against Pollution by Chlorides Arbitration,* the tribunal relied on the 'legal community' of riparian States of an international watercourse in applying a convention against pollution of the river. Argentina instituted proceedings against Uruguay in 2006 for its breach of agreements regarding the optimal utilisation of the Uruguay River by authorizing the construction of pulp mills on the river's banks a case that will test the treaties' ability to protect water quality.

19.3.2.1 Arbitration on the Protection of the Rhine Against Pollution by Chlorides (2004)

The controversy between the Netherlands and France regarding implementation of the Bonn Convention (1976) and the financing of the operations provided in an Additional Protocol (1991) was submitted to arbitration through the Permanent

Court of Arbitration. The purpose of the Bonn Convention is to combat pollution of the Rhine from contamination by chlorides, originating in the potassium mines of Alsace, and to improve public water supply. Not only France and the Netherlands, but also Germany, Luxembourg and Switzerland are parties to the Convention. The Protocol aims to improve the water quality of the Rhine, and it establishes the steps to be taken to implement the parameters and the proportion in which the Parties should financially contribute to them: Germany, 30%; France, 30%; the Netherlands, 34% and Switzerland, 6%. The estimated cost for the period 1991–1998 was 400 million French francs.

In the arbitration, the Netherlands contended that the interpretation of the provisions on the expenses for each Party is to be made in the light of the object and purpose of the Convention—improvement of the quality of the waters and public water supply according to the principle of good faith. France underlined that the purpose of the Protocol was to generate solidarity among the riparian countries, because the quality of the Rhine's waters was a common interest and should be financed on an equal basis. The Tribunal adopted the Dutch approach, analysing the 'object and purpose' of the Protocol, which was to improve the quality of the waters and the water supply from the Rhine. It recalled that "When the riparian States of an international river establish a common regime on the utilisation of its water, they reflect a 'community of interests' that leads to a 'legal community'", quoting from the *River Oder Case*. France was to reimburse the Netherlands the excess of the expenses it had incurred: 18,119,353.

19.3.2.2 The Pulp Mills on the River Uruguay (2006)

In 2006 Argentina brought a claim against Uruguay at the International Court of Justice on the grounds that Uruguay had breached its obligations under the 1975 Statute for the Uruguay River and other applicable treaties and rules of international law by authorizing the construction and operation of pulp mills on the Uruguay River, a boundary river between both countries (see Chapter 18, Capaldo, this book). Argentina requested the Court to declare that the un-notified and un-consulted Uruguayan decision created international responsibility and that consequently it should stop the works. Argentina also asked the Court to consider the harmful effects of the activities on the quality of the water of the Uruguay River and its related environment. The Court declined to indicate provisional measures, and the case is still pending.

19.4 Navigation

Navigation has always been an essential use of rivers. The evolution towards freedom of navigation of important international waterways, as well as the constraints necessary to secure that freedom, has been subject to international decisions, beginning with the confirmation of the freedom of navigation in the Rhine River subject to the payments of dues in an arbitral award in 1816. The International Court of Justice

has clarified the scope of freedom of navigation in Danube River in 1927. The Court described the limits of freedom of navigation features in a dispute between Belgium and the United Kingdom regarding the Congo River (*Oscar Chinn* 1934). Absent a treaty opening a watercourse to navigation, the umpire, in a case between Germany and Venezuela decided in 1903, found that the territorial country has a right of complete control of access to its national watercourses despite their potential use for access to the sea from an upper riparian country. Judicial proceedings ranging from 1886 down to today, have concerned a dispute between Costa Rica and Nicaragua over the right to navigate the San Juan River, a case related to the possible construction of an inter-oceanic canal. Overall, courts have stressed the scope of freedom of navigation in rivers with an internationalized regime, a freedom that does not limit the competence of the States to regulate transport in the watercourse.

19.4.1 Revenues from the Rhine Dues (1816)

On 16 November 1792, France proclaimed that rivers were the common dominion of riparian States through which they flowed. French influence spread this concept across Europe. The Paris Declaration (1802), an Act (1803) signed between the Holy Roman Empire and France, and the Paris Convention (1804) between the Empire and France, ended the existing dues on the Rhine, an important income for riparian governors but an obstacle to commerce. Customs duties and navigation dues were exempted (*octroi du Rhin*), (Parry 1981: 243–272). The Final Act of the Congress of Vienna (1815: Annex 16) provided Rules about freedom of navigation of international rivers as well as declaring several rivers (including the Rhine) subject to special regimes. The Final Act also established the Commission Relative to the Freedom of Navigation of Rivers and an Arbitral Commission to decide the revenues due to the beneficiaries of the Treaty of 1804. In 1816, it confirmed the status of the Act of Paris (1803), deciding that the German States on the right bank of the Rhine should pay the 'perpetual revenues' (*rentes perpétuelles*) from their incomes collected from the Rhine dues (*octroi du Rin*) for the benefit of France (1816: 218–221).

19.4.2 The San Juan River (1888), (1916), (2005)

Central America had been regarded as the ideal place to build an inter-oceanic connection between the Atlantic and the Pacific Oceans since the sixteenth century. Around 1858, the United States studied the possibility to build an inter-oceanic canal in the territory of Nicaragua, taking into account that Lake Nicaragua and the San Juan River connected both oceans almost naturally. By the Cañas-Jeréz Treaty (1858), Nicaragua and Costa Rica agreed that Nicaragua 'shall have exclusively

the dominion and sovereign jurisdiction over the waters of the San Juan river from its origin in the Lake to its mouth in the Atlantic; but the Republic of Costa Rica shall have the perpetual right of free navigation on the said waters'. The treaty declared that an inter-ocean canal would in no way impair the previous obligations contracted by Nicaragua (art. 7). An arbitral award in 1888 held that the treaty was valid, that Costa Rica did not have the right to navigate the San Juan River with warships, but that it could navigate with Revenue Service vessels. The award also affirmed that Costa Rica had prior consultation rights regarding agreements that Nicaragua could enter into for canal purposes. Another arbitration in 1897 declared that all the waters were under the jurisdiction of Nicaragua and the boundary line should follow the watermark of the navigable stretch of the river.

In 1913 and 1914, Nicaragua and the United States signed the Bryan-Chamorro Treaty (Parry 1981: 215–218), which conveyed in perpetuity to the United States the rights needed for the construction, operation, and maintenance of an inter-ocean canal along the San Juan River and Lake Nicaragua, or by any other route in Nicaraguan territory. Costa Rica protested against the agreement and submitted the controversy to the Central American Court of Justice asking to declare the Bryan-Chamorro treaty void and without effect. In 1916, the court declared that Nicaragua had no right to dispose freely of the waters of the San Juan River since 'her territorial ownership was charged with an obligation in favour of Costa Rica'. The court could not, however, declare the Bryan-Chamorro Treaty null and void because the United States was not subject to the court's jurisdiction (Judicial Decisions on International Law 1917: 181–229). The inter-ocean canal was never built, but episodes repeatedly disturbed the navigation rights of Costa Rica along the San Juan River. In 2005, Costa Rica submitted a dispute against Nicaragua to the International Court of Justice, but the decision is still pending.

19.4.3 Faber & Co. (1903)

After civil wars that occurred in Venezuela in 1898 and 1900, with damage to foreigners and foreign property, a German-Venezuelan Mixed Claims Commission was established in 1903 to resolve the claims of German commercial companies, including claims regarding impediments to navigation. The Colombian department of Norte de Santander is located on the eastern Andes, on the border with Venezuela, and have its closest communication with the Atlantic Ocean through the Río Zulia, a tributary of the Río Catatumbo, which enters the Venezuelan territory and flows to Lake Maracaibo and the Gulf of Venezuela. The Río Zulia was navigable by small steamers, and the German firm Faber & Co. navigated along the lakes and rivers of Colombia and Venezuela. In 1900, Venezuela suspended the clearance of vessels from the customs at the Catatumbo River, which meant the commercial isolation of the Colombian department of Norte de Santander. The German Empire protested to Venezuela for the interruption of its trade with Colombia, which was 'contrary to the principles of international law'. The umpire held that Venezuela,

in the lawful exercise of its sovereignty, could exclude ships of other nationalities and could even require ships flying its flag to be commanded by Venezuelans. He sustained the right of Venezuela to the complete control of navigation, and if it were necessary, to prohibit navigation on these rivers.

19.4.4 Jurisdiction of the European Commission of the Danube (1927)

The European Commission for the River Danube was established by the Treaty of Paris (1856) for the stretch of the Danube between its mouths in the Black Sea up to Isaktcha. The Treaty of Versailles (1919: art. 346) re-established the European Commission, except for a reduced membership. Another convention established the Definitive Statute of the Danube (1921), which reiterated that the navigation of the Danube should be free and open to all flags under conditions of complete equality. Two different Commissions were entrusted with the implementation of the Statute, namely, the European Commission of the Danube, with jurisdiction on the 'maritime Danube', and the International Commission of the Danube, whose competence extended over the navigable 'fluvial Danube' and certain other waterways. The internationalization of the Danube was guaranteed by the two Commissions from Ulm to the Black Sea. The interpretation and implementation of the powers of the European Commission encountered difficulties and the League of Nations submitted the question to an Advisory Opinion of the Permanent Court of International Justice. The Court was asked whether the European Commission of the Danube had the same powers on the maritime sector of the Danube from Galatz to Braila as between Galatz and the Black Sea, or if it did not have the same powers, if it possessed powers of any kind and what those powers were.

The Court recalled that before 1815 'the right to navigate rivers which separated or traversed two or more States was not regulated by any general principle or general act, and formed a subject of constant dispute'. However, the Final Act of the Congress of Vienna of 1815 declared that the navigation of international rivers 'along their whole course, from the point where each of them became navigable to its mouth, should be entirely free, and should not, in respect of commerce, be prohibited to any one, subject to uniform regulations of police'. As for the Danube, the 1856 Treaty of Peace of Paris declared that the Vienna principles regarding the internationalization of rivers would be also applicable to the Danube and to its mouth. The Court reached the conclusion that navigation included passing through a river, arriving and leaving a port, and going through a port, which meant that the powers of the European Commission embraced 'any movement of vessels forming part of their voyage'. As to the division of functions in the ports, the Court concluded that 'the powers of regulation and jurisdiction belong to the territorial authorities; the right of supervision, with a view to ensuring freedom of navigation and equal treatment of all flags, belongs to the European Commission'.

19.4.5 Oscar Chinn (1934)

In 1931, the Belgian government adopted measures granting special conditions and advantages for commercial transport in the River Congo to a Belgian company under State control, with disastrous effects for a private company of a British national, Oscar Chinn, that until that moment was in charge of river cargo. His suit in local courts, contending that the measures were contrary to the Convention of St. Germain (1919), was dismissed. The British government espoused Chinn's claim before the Permanent Court of International Justice. In a divided vote of six to five judges, the Court ruled that Belgium had not violated its international obligations and that there were no grounds for reparations.

More interesting in the *Oscar Chinn Case* than its specific decision is the reasoning of the Court in various senses. The Court dealt with the distinction between freedom of navigation and freedom of trade. The Court noted the special importance of the Congo River for the Belgian colony, '[p]enetrating, by means of its numerous tributaries, to the remotest confines of the territory, it makes it possible to exploit and turn to account the local sources of wealth of every part of the colony'. Regarding Belgium's obligations upon the River Congo under the international regime of the Congo Basin regulated by the Convention of St. Germain (1919) (Parry 1981: 485–502), the Court recalled that the Parties thereto agreed 'to maintain between their respective nationals …. a complete commercial equality in the territories under their authority' and that '[t]he trade of all nations shall enjoy complete freedom' (art. 1). The Court concluded that freedom of navigation comprised the 'freedom of movement for vessels, freedom to enter ports, and to make use of plant and docks, to load and unload goods and to transport goods and passengers', but did not include the 'special aspect of the commercial operations inherent in the conduct of the transport business' (Parry 1981: 434). In the case of the Belgian transport company, the Court saw only the 'natural consequence of the situation of the services under State supervision as compared with private concerns' which is also 'a possible effect of commercial competition'. The Belgian government was not under the obligation 'to guarantee the success of each individual concern' (Parry 1981: 435–436). The Court ruled that therefore the measures adopted by the Belgian government were not in conflict with its international obligations towards the British Government.

19.5 Final Remarks

Decisions of international adjudication bodies—judgments, arbitral awards, technical opinions or reports—have played a major role in the consolidation of customary rules of international law. This possibility is stressed by the Statute of the International Court of Justice (1945: art. 38(1)(d)) when it declares 'judicial decisions and the teachings of the most highly qualified publicists of the various nations, as subsidiary

means for the determination of rules of law'. In the realm of international water law, international decisions are scattered landmarks that contribute to building rules of international custom together with treaties, federal case law, declarations of international organizations, and the doctrine of renowned publicists.

The cases analysed here show that diverse jurisdictions use similar principles to resolve international disputes and at the same time a diversity of water issues that have caused differences between States. These issues refer almost exclusively to surface waters, because groundwater has been used by the countries as their exclusive national resource. (In the cases in this chapter, only the agreement on the River Zarumilla between Ecuador and Peru, applies to surface- as well as to groundwaters.) The common pattern of decision-making, whether in interpreting existing agreements or as general principles of law, is the invocation of equitable principles in the reasoning of the decisions. The rule of law applied by the adjudicatory bodies is the equitable allocation, distribution, utilisation, and administration of water resources, embedded in different formulations: the principles of 'community of interests', proportionality in the benefits, the duty to cooperate, not to cause significant harm to other riparian States, protecting water quality and the environment, among others, appear as the common denominator of the cases reviewed. The systematization of the case law of international tribunals allows one to deduce from an apparent dispersion, a general norm that provides for the application of equitable principles under the common denomination of equitable utilisation of water resources. This principle is now codified in the UN Convention (1997: arts. 5, 6) and in the Berlin Rules (International Law Association 2004: arts. 12, 13).

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Chapter 20
International Cooperation on Water Resources

Maria Manuela Farrajota

Abstract In international law, cooperation is a general and fundamental principle designed to facilitate the fulfilment of more specific obligations. The purposes and concrete applications of cooperation have been identified in several instruments in the context of the law of international water resources. This chapter identifies the different forms and levels of cooperation concerning water resources: from the minimum form of direct exchange of fundamental data and information to the establishment of joint development commissions or other institutional mechanisms for the integrated management of a river basin. It shows that the obligations to undertake specific cooperative actions in international law vary significantly. Furthermore, the important role played by international institutional arrangements and by international organizations in promoting cooperation on water resources is analysed. This chapter aims to understand the various modalities of cooperation and to concretise this all embracing, abstract concept.

Keywords International cooperation • international organizations • international water resources • joint commissions • negotiation

20.1 Introduction

Throughout history, States have shared transboundary water resources. Although States have permanent sovereignty over their natural resources, sovereignty is limited by the principles of equitable and reasonable utilisation and of diligent prevention of significant transboundary harm (Dellapenna 2003). The practical application of these general principles demands sophisticated cooperation, with States

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taking into account the interests of neighbouring riparian States and compromising the rights and interests by all (Lipper 1967: 33).

International water resource law evolved to settle water disputes peacefully and to develop cooperative alternative solutions. The principle of cooperation is critical and deeply rooted in international treaties and other instruments. But its inherent vagueness allows for its use without identification of any substance, that is, of what States, international organizations or private entities are required to do in practice. Thus, even if the obligation to cooperate is apparent, its application has to be determined in the light of all the facts and circumstances of each individual case.

This chapter analyses the principle of cooperation in general and in the context of international water resource law. It then identifies the different forms and levels of cooperation and analyses the variety and importance of international arrangements as well as the role played by international organizations. Finally, it discusses the issue of implementation.

20.2 Cooperation in General

The concept of cooperation has been used for centuries in political discourse with no legal content, mostly in a procedural sense to indicate attempts to resolve differences. But in international law, cooperation is a term-of-art, comprising a series of obligations in different contexts. Cooperation emphasizes the collective action of States engaged in joint projects towards a common end where States recognize that the mutual benefit outweighs any individual advantage (Axelrod 1990; Benvenisti 1996, 2002). Cooperative action is far more frequent than absent. Nevertheless, examples of failure to cooperate and its serious consequences raise awareness of its necessity. Bilateral cooperation addresses the circumstances of the particular case, while multilateral cooperation evidences interdependence at the regional and global level.

The concept of cooperation is used as a general purpose, principle or obligation in international legal instruments, from the Charter of the United Nations (United Nations 1945: arts. 1(3), 55, 56) and General Assembly Resolutions (United Nations 1970) to treaties on environmental protection and many other topics. In international law, ‘many terms that are inherently vague both for reasons of legal interpretation and for political expediency—“reasonable”, “equitable”, and “significant”, for example—make precise definitions difficult during negotiations’ (Beach et al. 2000: 13). The concepts leave room for interpretation from the context and in the light of the object and purpose of the treaty. Cooperation, an abstract concept, leads to legal uncertainty in many contexts. The work of international courts, tribunals, the International Law Commission, scholarly associations, such as the *Institut de droit international* and the International Law Association, and the writing of publicists, help to clarify its scope and content.

20.3 Cooperation on International Water Resources

In 2000, the United Nations General Assembly adopted in its Millennium Declaration the goal 'to halve, by the year 2015, the proportion of the world's people who are unable to reach, or to afford, safe drinking water', as well as 'to stop the unsustainable exploitation of water resources' (United Nations 2000). In 2002, the World Summit on Sustainable Development in Johannesburg reiterated these goals in its Plan of Implementation and added the target of reducing by half, also by 2015, the proportion of people without access to basic sanitation. The General Assembly declared 2003 the International Year of Freshwater, the period from 2005 to 2015 the International Decade for Action, 'Water for Life' (United Nations 2003), commencing on World Water Day, 22 March 2005, and 2008 the International Year of Sanitation. Several other conferences have discussed complex issues regarding water, resulting from the recent recognition of existing and potential global fresh-water related problems. A leading example is the programme 'From Potential Conflict to Co-operation Potential', part of UNESCO's World Water Assessment Programme.

The attention paid to water issues is not of transient importance. The need for States to avoid conflict and invest in cooperation is now a common call. Indeed, as history shows, notably through the number of negotiated water treaties, water is more likely to lead to international cooperation than to conflict (Wolf 1998). In the nineteenth century, most water treaties focused on navigation and fishing. Subsequently, treaties dealt with irrigation, hydro-electric power generation, flood control, or prevention of pollution. If other water uses were mentioned in the treaty, they were regulated only by reference to the principal purpose of that treaty (Dellapenna 1994). Increasingly, treaties focus less on the allocation of waters or the regulation of one specific use and adopt an integrated river basin management approach and establish joint commissions with wider powers and functions in order to attain the optimal utilisation of shared water resources and maximize the benefits derived from them, while protecting and preserving the riverine environment. Recent treaties reveal multiple forms of cooperative action steadily becoming more intensive.

The UN Convention on the Law of the Non-Navigational Uses of International Watercourses (United Nations 1997), a global framework convention, resulted from a long process of codification and progressive development of international watercourses law by the International Law Commission. Article 8(1) specifies a general obligation to cooperate 'on the basis of sovereign equality, territorial integrity, mutual benefit and good faith'. This aims to enhance the 'normative force of other provisions of the Convention on specific aspects of cooperation' (Tanzi & Arcari 2001: 183). Article 5(2) refers to the principle of participation, which includes both the right of riparian States to utilise the watercourse and the duty to cooperate in the protection and development thereof. Thus, the obligation to cooperate is a component part of the obligation of participation. The form of cooperation suggested is the establishment of joint mechanisms or commissions 'to facilitate cooperation on relevant measures and procedures' (art. 8(2)).

Some regional conventions also provide a legal framework for inter-state relations and often prescribe cooperation as a general obligation (Helsinki Convention 1992: arts. 2(6), 9(1); Revised SADC Protocol 2000; see Chapter 15, Van der Zaag, this book). Particular river treaties (Indus Waters Treaty 1960: art. VII; Danube River Convention 1994: art. 2), as well as declarations and studies by scholarly associations (*Institut de droit international* 1979: art. IV(b); International Law Association 2004: art. 11) and international conferences and organizations (United Nations 1977: rec. 85; United Nations 1992: ¶¶5, 7, 27) refer to cooperation as an obligation or as a guiding principle or policy objective.

The obligation to cooperate regarding water reflects the reality that because international water resources are shared, cooperation is crucial. The UN Watercourses Convention (1997) and regional conventions set out a general formulation of the purposes of cooperation. This is because more specific purposes vary depending on certain factors, such as the geographical characteristics of the river basin, or the uses and needs of the watercourse States. The main purposes are the optimal utilisation of water resources, the equitable and reasonable sharing of these resources between the riparian States, the sustainable use and development of the river basin, the prevention, mitigation or elimination of transboundary harm, and the protection and conservation of the environment.

The principle of cooperation is manifested primarily through specific procedural rules, i.e., formal rules of communication between States. Procedural rules play a critical role in the implementation of the substantive principles of equitable and reasonable utilisation and of diligent prevention of significant transboundary harm, as well as the protection of the environment. The 'Procedural Law of Co-operation' (Higgins 1994: 136) aims to provide States with some guidance as to the best manner of maintaining cooperation on a continuous basis concerning their common resources (Tanzi & Arcari 2001: 21). These rules developed from recommendations of scholarly associations, gained consistency with treaty practice, and evolved towards more intensive degrees of cooperation, notably through adoption of an integrated approach.

20.4 Forms and Levels of Cooperation

Forms or types and levels of cooperation range from a minimal direct exchange of fundamental data and information to the establishment of joint development commissions or other institutional mechanisms. This section explores the modalities of cooperation and structures a concept that is usually viewed as an all embracing, abstract idea in terms of: context, geographic location, entities involved, time variables, and the nature of activities.

Context: Cooperation for security and prevention of conflicts is distinct from cooperation for the resolution of existing disputes. The latter takes the form of diplomatic negotiations between States, but may involve third parties using good offices, mediation, fact-finding, conciliation, international adjudication or arbitration. As to the former, one may distinguish between preventive cooperation, i.e., to prevent

conflict or transboundary harm, and *ex post facto* cooperation, i.e., to mitigate or eliminate existing damage after unilateral actions or specific accidents. Such cooperation in normal circumstances (e.g., regular exchange of hydrological data) can be differentiated from cooperation in situations which change the *status quo*, such as notification of planned measures (e.g., the construction and operation of a dam and a hydroelectric power plant), or early notification in emergencies (e.g., an accident potentially causing transboundary damage).

Geography: Spatial delimitation plays a key role in defining the scope of cooperation. Cooperation may be at the global, regional, river basin, national and local level. The territorial reach of cooperation between or among States often is delimited by a drainage or river basin, the most accepted hydrological unit for planning and management purposes. In some cases, the basin may be considered without a particular portion for different reasons, e.g., if a region is very small and has little impact on the rest of the basin, or is located in a State not willing to participate in the basin's development. Thus, the Mekong River Basin Agreement (1995) does not include China and Myanmar although they are the source nations for the river. Other spatial factors include boundary waters (e.g., in early navigation treaties); zones or sub-basins with concentrations of projects (e.g., dams within a specific area of the basin); or regional development (e.g., a neglected or critical geographical region, which may not coincide with the limitations of one international river basin, but may include portions of more than one basin) (United Nations 1975: 48–54). Some concrete obligations may be applied at the local level, regulated by domestic law, mainly between the local administration or government and its communities, and others, such as those relating to emergencies, may be applied over long distances extending to several States.

Participants: Cooperation under international law is developed through diplomatic relations and leads to treaties and other forms of state practice. It may be based on communications between national institutions, or it may be given an independent form, such as a river basin commission or river authority. It may also be developed through international inter-governmental conferences where international organizations may participate. The number of international inter-governmental organizations with water related issues on their agenda has significantly increased in recent decades, and their role continues to grow, both in scope and intensity (Salman 2003b, 2004). Increasing knowledge and awareness of the current global water situation has led international organizations to devote themselves to the topic with objectives ranging from assessment of resources and capacity building to security issues and the financing of water projects.

International law, through treaties (e.g., Aarhus Convention 1998) and resulting or parallel domestic legislation, seeks to foster public participation and local government participation in national decision-making concerning the whole basin. Civil society, particularly local communities and water users' associations, brings its views to the attention of local governments and take initiatives, often supported by non-governmental organisations. For example, people affected by dam construction may put forward their views and concerns and be actively involved in the decision-making process. This practice is not yet widespread and may become

quite complex, frequently featuring opposing political views, as may be illustrated by the Narmada dam case in India (see Chapter 10, Cullet & Gupta, this book).

Recently, non-governmental organisations have also been focusing on water resource problems, strengthening civil society and regional cooperation by providing a means for organized citizen participation in decision-making processes that concern them. They also promote pluralism by pressing the interests of different cultural and ethnic groups. They are now an important part of the foundations of democratic societies. Whether national or international, their role has directed the attention of governments to water problems and has provided guidance, capacity building, and help in solving concrete problems of a legal, strategic, or technical nature. A good example is the work of WaterAid, an international NGO established in 1981 that focuses on water supply and sanitation. It works with local partner organizations to help local communities build and maintain water and sanitation projects. In a related vein, the work of scholarly associations, like the *Institut de droit international* and the International Law Association, was crucial to the development of international water law.

Timing: Cooperative action may be required for a limited period of time (e.g., during a specific project governed by an agreement, such as flood prevention works, or for the provision of relevant information in emergencies) or for the establishment of a long-term relationship, usually regulated by agreement and often involving the establishment of a joint body. Although treaty based cooperation exists for sporadic or specific purposes (e.g., Ganges Water Treaty 1996), the clear trend, as treaties tend to become more comprehensive in scope, is to provide for a stable and long-term relationship for the management of the geographical area concerned, whether this consists of one or more river basins or parts thereof (e.g., Luso-Spanish Agreement 1998).

Activities: International treaties, both expressly and implicitly, and in both mandatory and soft law terms use different applications of cooperation. The terms used include the obligation to 'promote' or 'seek to promote' or 'promote and facilitate' or 'stimulate and advance' a conduct of an activity; or to 'establish' or 'promote the establishment of' or 'strengthen' an institution or regime; or to 'take effective or necessary measures' to implement a specific course of action. Cooperation may be of a technical, educational, economic, financial, administrative, legal, or political nature. It also covers a wide spectrum of activities, such as planning, development, regulation, management, environmental protection, use and conservation, forecasting, etc. Procedural cooperation may take a number of forms depending on the activity performed. The most common modalities reflecting increasing levels of cooperation are discussed below:

- Collection and Exchange of Data and Information: The general obligation to exchange data and information between States is a 'precondition for the realisation of higher degrees of co-operation' (Tanzi & Arcari 2001: 195). It is well established in treaty practice (e.g., Helsinki Convention 1992: art. 13; United Nations 1997: art. 9). The systematic exchange of different types of information of a technical, scientific, or administrative nature has been recognized as

an obligation under customary international law (International Law Association 2004: art. 56). Although the types of data and information to be shared regularly are not always specified in the treaties, frequently they relate to the general conditions of the aquatic environment, the measurement of water flow, extractions, releases from reservoirs, sources of pollution, etc. Treaty provisions may include the collection and processing of data and information relating to an international water resource (e.g., Indus Waters Treaty 1960: art. VI). The frequency of the exchange may be specified, ranging from a specified timetable to exchange on request (e.g., Helsinki Convention 1992: art. 13(3); Luso-Spanish Agreement 1998: art. 5(3)). Several treaties also set forth the obligation to provide different types of data and information related to a specific use or on specific occasions, such as in the case of planned measures and in emergencies (e.g., Zambezi Action Plan 1987: art. 18). States may establish joint databases and rules for rapid information exchange in crisis situations, such as floods, droughts, or accidental pollution. They may also exchange information on national water policy plans, including basin action programmes and plans, as well as the revisions made to relevant laws and regulations (e.g., Luso-Spanish Agreement 1998: art. 5(2)). The communications between the parties may take place through a joint established body, or between the departments of different Ministries. In fact, the collection of data on water flow is one of the main tasks entrusted to joint bodies.

- Notification of Planned Measures: A State has the obligation to notify potentially affected States of planned measures when it intends to carry out works (e.g., dams) on its territory on an international river, lake or aquifer before the proposed measures are implemented. The planning State must provide relevant technical data and information, including the results of any impact assessment, relating to the works and risks involved and the potential harm to the other States. The notification allows the potentially affected States to make their own evaluation and to initiate a period of consultations with the planning State. The UN Watercourses Convention (1997: arts. 11–17) provides a detailed notification procedure, to a great extent codifying existing practice. It does not, however, refer to, or produce a listing of, the types of activities that require notification. Small-scale works, such as minor alterations or additions to an ongoing project, seem to be excluded from the obligation. The practice is widespread, consistent and not simply based on treaty (Farrajota 2005: 299–310; Kirgis 1983), and it has been argued to have already crystallized as an obligation under customary international law (e.g., International Law Association 2004: art. 57). Exceptions to the regular notification procedure are also included in treaties and resolutions (United Nations 1997: art. 19; International Law Association 2004: art. 61), usually due to urgency in order to protect public health, safety or security.
- Impact Assessments: Impact assessments are preliminary viability studies of projects that evaluate the effects of the proposed activities on the planning State and on other potentially affected States. The obligation to carry out impact studies has been included in treaties since the nineteenth century. In contemporary treaties, this obligation has also focused on environmental impact assessments.

Environmental impact assessments aim at ensuring that the environmental effects are taken into account at an early stage in decision-making at the domestic level, but they also foster the participation by potentially affected States in the procedure itself and may lead to consultations or negotiations in order to resolve anticipated problems. Notification of, or the possibility of a request by another State to undertake, an impact assessment are expressly provided for in numerous international and regional legal instruments (e.g., Danube River Convention 1994: art. 7(5)(f); Espoo Convention 1991; United Nations 1978: ¶5), and are well-established in domestic law.

- Notification of Emergencies: Emergencies may result from natural causes (e.g., floods, droughts, cyclones), or from human conduct (e.g., industrial accidents), or from both (e.g., a flood caused by earthquake damage to a dam). The purpose of prompt notification is to enable potentially affected States to prevent, minimize or eliminate the harmful effects on human life, property and the environment, by taking the necessary measures. Notification, an obligation that is now generally accepted and well established in treaty practice (e.g., Indus Waters Treaty 1960: art. IV(8); Rhine Agreement 1976: art. 11; United Nations 1997: art. 28), must contain all necessary information about the nature of damage, its likely effects and the possible precautions that need to be taken. At the regional level, the Helsinki Convention (1992: arts. 14, 15) goes beyond the usual notification requirement and provides for the obligation of States to set up 'where appropriate' warning and alarm systems, thus calling for cooperation between States at a stage where prevention may still be possible. These systems consist of different procedures to manage crises, in particular monitoring, forecasting, early warning, and evacuation plans in case of catastrophes.
- Consultations: The obligation to consult other States is well established in treaties (e.g., United Nations 1997: arts. 6(2), 17(2), 24(1)). Consultations may be viewed as a form of negotiation, whereby States exchange information and discuss pending issues, such as the potential impact of actual or proposed uses of the waters and ways to prevent, mitigate, or eliminate their potential or actual adverse effects. They may discuss plans to develop the shared resource individually or jointly, or the measures to protect and preserve its environment. Consultations may take place after notification of planned measures or upon request of any riparian State within a suitable time in order to have practical results. Potentially or actually affected States may manifest their position and contribute to the decision-making process concerning existing or planned uses. The planning State is to take these positions into account and, if necessary, change the project. Under general international law, prior consent from the affected State is not required (*Lake Lanoux Arbitration* 1957; Kirgis 1983: 20), but many treaties do include it (e.g., Israel-Jordan Peace Treaty 1994: Annex II, art. V(1); Mahakali Treaty 1996: art. 7). Requiring consent may prevent conflicts in cases where water is scarce and its allocation is disputed (Sohnle 2002: 354).
- Negotiations: Negotiations may be viewed as a process, comprising consultations as a preliminary stage, or as an obligation *stricto sensu*, that is, an obligation to negotiate in good faith in order to reach an agreement. Negotiations are the

foundation of all forms of cooperation and link the procedural obligations with mechanisms for the settlement of disputes. Negotiations may take place at any time and at different levels. They may be conducted through normal diplomatic channels, summit discussions, or competent authorities. When a joint commission has been set up, negotiations usually are carried out within its framework.

- Capacity-building: Capacity-building includes the exchange of available technology (Helsinki Convention 1992: art. 13(4); Danube River Convention 1994: art. 12(4); Revised African Convention 2003: art. XIX), the exchange of scientific and technical information and of experience and research results, and the provision of technical assistance in different water-related matters, including desertification control, weather modification, and desalination. They involve forms of human resources development, such as joint education and training schemes (Revised African Convention 2003: art. XX), and the organization of academic conferences, symposia, seminars, courses, and discussions. Capacity-building is one of the elements of successful treaty implementation, as it promotes the balance of capabilities to manage water resources among riparians. These regional differences may become a driving force for cooperation. Cooperation may also be offered on the elaboration of national legislation, including standards, procedures and organizational structures, and as assistance to the implementation of international standards. Some treaties envisage joint projects of research and development when an underlying relationship has already been developed in the educational or technical areas (Helsinki Convention 1992: arts. 5, 12). These include the preparation of surveys and joint scientific studies and assessments on water issues (United Nations 1978: ¶8). Such activities may be better developed in a network of institutions comprising universities, non-governmental organisations, international organisations, and relevant government departments.
- Joint Plans, Institutions, and Projects: The preparation and execution of joint river basin development plans, including compatible strategies for water conservation and environmental protection, may be more effective than those prepared by States individually. They may also require the revision of domestic policies and legislation to harmonise the plans and activities within neighbouring States (International Law Association 2004: art. 62). Operational rules for large dams may be jointly prepared when these may impact on more than one riparian State. Joint action plans may also be prepared for water use, management, water pricing, or inter-basin water transfer. Optimally, such a form of cooperation is implemented within the river basin as a whole and using an integrated management approach (International Law Association 2004: art. 6). The different mechanisms adopted, or commissions created, through which the other modalities of cooperation are implemented, reflect the existing level of cooperation between States. States do so through regular communications, as well as the monitoring and supervision of cooperative action, or even joint decisions (International Law Association 2004: arts. 64, 65). Joint projects (or joint ventures) are sometimes used to implement treaties and regulations (International Law Association 2004: art. 66; Revised African Convention 2003: art. XIV(2)(b)), and usually include

joint programmes for monitoring the conditions of the transboundary waters and assessment of any transboundary impact (Helsinki Convention 1992: art. 11). They are normally carried out through joint commissions. Treaties often require that the costs of these and other necessary activities are borne jointly and on an equitable basis by the cooperating basin States (International Law Association 2004: art. 67; United Nations 1997: art. 25(2)) or by a requesting State if the activity is performed at its request, unless otherwise agreed (United Nations 1997: art. 9(2)). For major projects, such as the construction and operation of large dams, financial support from third States, whether riparian or not, and from development banks and agencies is often necessary, usually in the form of syndicated loans.

20.5 The Diversity of Institutional Arrangements

Most forms of cooperation are channelled through an institutional arrangement. In fact, the earliest form of international organization was the Commission for Navigation in the Rhine established in 1815 with power to regulate navigation and settle disputes. In 1911, the *Institut de droit international* recommended the establishment of joint commissions (*Institut de droit international* 1911: ¶II(7)), followed by the International Law Association (e.g., International Law Association 2004: arts. 64, 65). In addition, several international organizations (e.g., United Nations 1978: ¶2) and conferences (e.g., United Nations 1977: rec. 84) also concluded that international river and lake organizations are the 'appropriate bodies for initiating studies and recommending measures, contingency plans and warning systems, as well as for conducting the necessary ongoing review of conditions and the adequacy of measures undertaken' (United Nations 1983: ¶49).

Institutional arrangements vary in type and method of establishment. They may be established through ministries, water resources administration organs or councils, or other domestically competent institutions designated as having ultimate responsibility over water resources (Salman & Bradlow 2006: 152). State relations may also be developed through joint bodies, commissions, or authorities created by treaty, with different powers and functions, whether of a technical, economic and financial, legal, or administrative nature. Joint commissions may be established on a permanent basis or *ad hoc*, and may consist of one or more bodies. Most commissions are composed of technical experts appointed in equal number by each State. But they may also include legal advisers, government ministers, or even heads of state.

The powers and functions of joint bodies depend on various factors, such as the kind of cooperation envisaged, the desired degree of involvement in international management, or the specific field of administration. Joint commissions serve as a channel to maintain formal communications and provide a forum for dialogue between States, to maintain good neighbourly relations and prevent and settle disputes. Most of them have powers to examine, investigate, and, in some cases, to resolve

problems arising from treaty implementation. In addition, joint institutions may be responsible for: establishing observation stations; advisory and consultative functions, such as the evaluation of projects and the issuing of recommendations; co-ordinating policy-making; and monitoring functions, such as the investigation of States' compliance with the treaty. They may be charged with the preparation and execution of projects, and the establishment of harmonized standards.

While international law does not require States to establish joint institutional mechanisms or bodies (Benvenisti 1996: 413; International Law Association 2004: art. 64 commentary; Perrez 2000: 317), widespread treaty practice provides for such arrangements. The Helsinki Convention (1992: arts. 9(2), 10) provides for the conclusion of additional agreements and obliges co-riparian States to establish joint bodies by agreement. The UN Watercourses Convention (1997; art. 8(2)) does not require the establishment of joint bodies, but indicates that States should use the 'experience gained through cooperation in existing joint mechanisms and commissions in various regions'.

20.6 The Role of International Organizations

In some instances the establishment of a joint body might be insufficient to deal with transboundary water challenges, and States might require the supervisory assistance of international organizations (Agenda 21: chs. 18, 38). International organizations or agencies, such as the United Nations Environment Programme, the United Nations Development Programme, the United Nations Educational, Scientific and Cultural Organization (UNESCO), or the Organization for Security and Cooperation in Europe, in promoting cooperation on water resources, act as a provider of expertise, administrator, facilitator, mediator, and provide a forum for consultations and negotiations in actual or potential disputes. This role was emphasized in the *Gabčíkovo-Nagymaros Project Case* (1997: ¶143), where the International Court of Justice declared that 'both Parties can profit from the assistance and expertise of a third party. The readiness of the Parties to accept such assistance would be evidence of the good faith with which they conduct bilateral negotiations in order to give effect to the Judgment of the Court'.

Certain material circumstances call for the intervention of international organizations to foster cooperation, such as where no direct contact between the States exists, possibly because of armed conflict, non-recognition, or the absence of diplomatic relations. The International Law Commission considered that this issue is best dealt with by a clause specifically providing for indirect procedures. Hence, the UN Watercourses Convention (1997: art. 30) states that in such cases States must fulfil the obligation to cooperate through an indirect procedure, for example, through third States, peace commissions, or the good offices of an international organization.

Another form of cooperative action involving international organizations includes enlisting their political and financial support for specific projects. This is illustrated

by the Zambezi Action Plan (1987: art. 4(2); *see also* Chapter 15, Van der Zaag, this book), which provides for the financial support of a number of international organizations, but also requests their assistance in implementing the Plan. But it is through standard-setting and policy-making that international organizations have contributed to the development of water law. An example is the United Nations Environment Programme's Principles on Shared Natural Resources (1978).

The successes and failures of international organizations in dealing with international water issues have been persistently reported in the media and have been the subject of different analyses. For example, the World Bank assumed the role of international mediator in the Indus waters dispute between India and Pakistan. Following long negotiations, the parties accepted a Bank proposal leading to the conclusion of the Indus Waters Treaty (1960), the main purpose of which was to increase the quantity of water available to both States through equitable apportionment of the water resources. This treaty is generally regarded as a success story of conflict resolution (Salman & Uprety 2002, ch. 2; Salman 2003a). Although this success generated high expectations regarding the Bank's role as mediator, the Bank has hardly been directly involved in other international water disputes. Other cases of successful mediation include the key role played by United Nations Development Programme in the negotiation process of the Mekong River Agreement (1995; *see* Nakayama 1997: 370–373) and that of United Nations Environment Programme in the Zambezi Action Plan (1987), notwithstanding the difficulties in actually implementing it. The World Bank and the UN organs, however, have been unable to mediate successfully in the Ganges River dispute (Nakayama 1997: 376–379; *but see* Salman & Uprety 2002), even if India and Bangladesh did conclude a treaty, valid for 30 years, to share the waters of the Ganges River at Farakka (1996).

20.7 Implementation

Agreements often offer guidance as to implementing action to complement the obligation to cooperate. Applications of the obligation are crystallised within the agreements themselves into specific detailed commitments capable of direct practical implementation. But implementation provisions vary to a great extent as to their nature. These may state the general aim and purpose of the form of cooperation; list its objectives with a reasonable degree of detail; list measures aimed at achieving such objectives; specify protective measures likely to promote this form of cooperation; recommend implementation measures at the national and international levels, such as the preparation of legislation; and articulate the duty to cooperate as the basis for concluding additional arrangements or agreements supplementing or interpreting the original treaty (Pinto 1986: 146–154).

The point of departure for such agreements may be the general obligation to cooperate undertaken through a framework convention, such as the Helsinki Convention (1992), or the UN Watercourses Convention (1997). This requires that

States elaborate on the scope and frequency of the action that they consider effective as compliance with the obligation. Supplementary agreements aim to translate the general obligation into detailed provisions/actions so that implementation can take place and be monitored by the parties. Further agreements detailing the rights and obligations of the parties, the timing of the prescribed actions, financial obligations, national entities responsible for tasks assigned, the establishment of joint organs and the scope of their responsibilities, protective measures in relation to any special risks, and eventually forms of settling disputes, are essential to ensure compliance. A self-contained agreement makes cooperative obligations self-executing, without the need for regular recourse to Governments or third-party mechanisms for interpretation (Pinto 1986: 153–154).

Problems in implementing existing watercourse treaties may relate to the establishment of joint mechanisms or commissions, notably because this requires investment and government spending. But the lack of adequate legal mechanisms amongst riparian States also forms an obstacle to obtaining grants, loans, and foreign investment. Thus, several agencies and donors, such as the Global Environment Facility, have increasingly been supporting the implementation of water resources agreements in different continents.

20.8 Conclusions

The obligation to cooperate in the law of international watercourses has progressively evolved in its different applications and forms towards a more intense level. States have consistently manifested in their international practice the will to improve cooperation with their co-riparian States. As in the past, most States today choose cooperation over conflict, and see that cooperation is in their own long-term interest as well as that of the international community. The principle of cooperation has been affirmed in conventions, treaties, declarations, and international decisions, and has been relied on by States and incorporated into national laws and decision-making practices. It has been a dynamic source of other rules of international law and its repeated use in international instruments demonstrates that States recognize cooperation as a basis for other obligations. This is evidenced by the multiple forms and levels of cooperation in the practice of States, given precision and procedures in countless treaties.

Under international law, the practical application of customary international rules, and adherence to general principles, is more significant than any expression of acceptance in particular international instruments. Cooperation, being an obligation of conduct, derives from the substantive obligations as clearly evidenced by relevant international instruments and decisions as well as by other forms of state practice. Thus, a body of authority supports the proposition that States have a general obligation to cooperate with co-riparians regarding shared international watercourses. However, even if this is formally binding, it is somewhat *soft* in character because of the lack of precision as to what exactly is required. This principle

is manifested through procedural obligations, including the obligations to exchange data and information regularly, to notify planned measures with possible adverse effects, to notify the existence or the threat of emergency situations, to enter into consultations, and to negotiate concerning planned measures. Cooperation has evolved to include obligations of public participation in decision-making at the local, national, and regional level (Aarhus Convention 1998). In addition, international organisations, which have successfully contributed to the development of different forms of cooperation, have been actively involved with water issues, including assessment of water resources, determining areas at risk, and investing in capacity-building worldwide.

Framework conventions, such as the regional Helsinki Convention (1992) and the global UN Watercourses Convention (1997) play an important role in providing model rules implementing the obligation to cooperate. The former has been successfully implemented in Europe and may serve as an example for other regions. The UN Watercourses Convention, although not yet in force, has influenced subsequent regional treaties, such as the Revised SADC Protocol (2000), as well as particular bilateral and multilateral treaties from different regions, such as the Incomati Tripartite Interim Agreement (2002) or the Mekong River Agreement (1995), which is based in the 1994 draft of the UN Watercourses Convention. The provisions of the UN Watercourses Convention serve as persuasive policy guidelines, since all States participated in the convention's elaboration, and assist in the interpretation of particular existing watercourse treaties in the context of specific controversies. Similarly, the work of codification and progressive development of international water resources law—particularly the *Berlin Rules on Water Resources* (International Law Association 2004), its final and most comprehensive work on the topic of international water resources law—will remain an important source of guidance and reference for States, international organizations, local governments, and water professionals.

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Chapter 21
Public Participation in Water Governance

Jona Razzaque

Abstract Public participation in water management remains an evolving issue. International and regional instruments provide mechanisms for local community participation in water related projects and policies. This chapter gives an overview of the growing participatory rights and how participatory processes have influenced the institutional, legal, and political development of water law. It assesses the efficiency of participatory mechanisms, the interplay between law and institutions, and the influence of people on policy- and decision-making. The chapter concludes that water governance is shaped primarily by domestic process with some influence from international processes, with interaction between formal and informal modes of participation.

Keywords Local community • infrastructure projects • international instruments • privatisation • public protests • public participation • water management

21.1 Introduction

Local users of water resources often have no access to information concerning water planning and no right to participate in decision-making processes affecting those waters. Governments often authorise large infrastructure projects and water service concessions without consultation with local communities and without civil society scrutiny. This may undermine livelihoods in local communities. Individuals and organisations affected by water development plans, infrastructure projects, and privatisation of water services have increasingly demanded greater consultation and more transparent and accountable decisions. This demand can be attributed to a decline in public confidence in political processes and a reduced trust in the policy makers (Richardson & Razzaque 2006). Public participation in water

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resource management has developed significantly in recent years. Internationally, several interrelated factors have fuelled the growth of participatory processes in decision-making (Barton 2002; Dobson 1998). The primary reasons are increased public awareness and concern about the relationships between environmental health and human well-being. The growth of human rights in legal and political systems has also heightened people's expectations of participation in policy-making. The prevailing concern of the international community for 'good governance' and the strengthening of civil societies have also contributed to increasing interest in participatory mechanisms (Steffek et al. 2007).

Over the years, public participation has assumed various forms. Following a 'bottom-up' approach, people can share information and responsibilities, design and implement programmes, share the benefits of development programmes, and monitor and evaluate such programmes (Arnstein 1969). Forms of participation have included education, information dissemination, public advocacy, public hearings and submissions, and litigation (Stec & Casey-Lefkowitz 2000). Such public participation may assist decision-makers to understand and identify public concerns while formulating environmental policies (Petkova et al. 2002). Within the water sector, there is a strategic shift from consultation to shared decision-making with respect to water management plans at the local level (Rogers & Hall 2003). While it is possible to participate passively, this chapter focuses on active participation by organised groups, communities, and the general public.

This chapter offers an overview of various ways, formal and informal, that participatory mechanisms are being developed and applied at various levels of water governance, examining how participatory processes have influenced the institutional, legal, and political development of water law. It concentrates on three issues: evolution of the concept of 'public participation' relative to water law; international, regional, and national participatory techniques; and the formal and informal processes that facilitate participation in local water governance, including how social protests interact with political and legal processes. The chapter explores cases where governments have adopted some form of public participation (Rowe & Frewer 2004). The chapter shows that public participation is firmly integrated in many international, regional, and national legal instruments. For developing countries, where policies related to water management may not always be implemented, informal participatory mechanisms are, in some cases, more effective than formal processes for managing water resources sustainably.

21.2 Evolution of Public Participation Relative to Water

Public participation in water management is not new. Examples of water users associations existed in some European rural communities over 1,000 years ago (van de Ven 1993). A structured form of public participation began to appear in the planning and environmental regulations of some nations during the 1960s and

1970s, coinciding with the political upheavals of times when the public agitated for more democratic governance and stronger environmental protection (Barton 2002). During the 1970s and 1980s, commentators increasingly emphasised the value of a 'bottom-up', people centred approach to economic development (Spyke 1999). By the 1990s, consultation and participation, often in the form of legal requirements for public commenting periods and public hearings, came to be considered the key to successful environmental decision-making, feeding into broader discourses on 'good governance' and 'environmental justice' (Kuhn 1999; McCormick 1995).

In developing countries, participation is often manifested in calls for greater local community involvement in development planning and poverty alleviation (Aycrigg 1998). In Africa and Asia, participation is more common in the impact assessment of donor-funded projects (Wood 2003). In developed countries, public participation has tended to take a more legal form than in many developing countries, where it has typically been confined to non-binding policy mechanisms (Renn et al. 1995). International organisations play an important role in financing large-scale infrastructure projects on water. International financial institutions, like the International Monetary Fund, the World Bank, and regional banks, require more information disclosure and consultation for affected parties along with a possibility for the affected communities to challenge the decision of the institution (Barton 2002). For example, the Inspection Panel of the World Bank allows people affected by Bank-funded projects (including dams) to seek redress if the Bank fails to follow its policies. These initiatives acknowledge that civil society plays a crucial role in shaping the decision-making processes of international organisations more transparent (Oberthür et al. 2002). These institutions also emphasise the need to decentralise water services and to achieve 'full cost recovery' that can act as an incentive to private investment (World Bank 2004).

Other international organisations, such as the World Commission on Dams, Global Environment Facility, United National Environment Programme, and a number of international non-governmental organisations (e.g., the International Union for the Conservation of Nature or the Global Water Partnership) have developed publicly available information on water management. In addition, regional organisations, such as the UN Economic Commission for Europe, the Southern African Development Community, and the Organisation of American States, highlight the importance of public participation in the water resource management. Both non-binding and binding international legal instruments deal with 'public participation' in water management.

Participation of all stakeholders is considered the first basic attribute for effective global water governance. The broad definition of 'public participation' includes access to information and justice. The following discussion examines some of the participatory mechanisms linked to water rights and available under the human rights law and international environmental law, even though the primary instruments initially were not binding. More recently, several binding legal instruments elaborate on the non-binding principles (e.g., Aarhus Convention 1998). Arguably, 'a right of public participation has now become a general rule of international law regarding environmental management' (International Law Association 2004: art. 18).

Significant developments of participation are also found in river basin regimes because active participation in basin management may lead to a better protection of ecosystem services.

21.2.1 Participation under International Human Rights Law

The Universal Declaration of Human Rights (1948: arts. 19, 20) recognised a right to political participation and freedom of assembly, opinion and expression. While the Universal Declaration is not legally binding, the International Covenant of Civil and Political Rights (1966: arts. 19, 25) is and it elaborates on these obligations. The most recent human rights instrument addressing participation is General Comment 15 (2002: ¶48) on the implementation of Articles 11 and 12 of the International Covenant on Economic, Social and Cultural Rights (1966), which indicates that:

> the right of individuals and groups to participate in decision-making processes that may affect their exercise of the right to water, must be an integral part of any policy, programme or strategy concerning water. Individuals and groups should be given full and equal access to information concerning water, water services and the environment, held by public authorities or third parties.

If domestic water systems are controlled by third parties (as where concessions have been signed), States must impose effective regulatory systems that includes independent monitoring, genuine public participation, and of penalties for non-compliance (General Comment 15 2002: ¶24; Razzaque 2004b). It also indicates that States must monitor the realisation of the right to safe drinking water. General Comment 15 is not a legally binding document and some academic commentators consider it to be ahead of its time (McCaffrey 2004). The implementation of the General Comment at the national level will largely depend on the good will of states, although they are obligated to report to the Committee on Economic, Social, and Cultural Rights on the progress in fulfilling the right to water (Morgan 2006).

21.2.2 Participation in International Environmental Law

Provisions of numerous international environmental law agreements allow communities and individuals to participate in the national policies and projects on water. Since 1970, major international environmental policy statements have called for increased community involvement in environmental decision-making (e.g., Rio Declaration 1992: ¶10; Stockholm Declaration 1972: preamble (6), (7)). While the participatory language in these 'soft' (non-binding) instruments does not specifically mention 'water,' it emphasises the importance of public involvement in matters linked to environment and development. For example, Rio Declaration (1992: ¶10) states:

> Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.

The Stockholm Declaration (1972) and the Rio Declaration (1992) played a crucial role in the development of participatory tools in at the national level. Agenda 21 (1992: ch. 23) includes general provisions on participation. The Agenda (ch. 18) also urges governments to facilitate 'the active participation of women, youth, indigenous people and local communities in water management,' adding:

> To design, implement and evaluate projects and programmes that are both economically efficient and socially appropriate within clearly defined strategies, based on an approach of full public participation, including that of women, youth, indigenous people and local communities in water management policy-making and decision-making.

Other widely recognised international policy documents emphasise the need for an adequate role of the public, including non-governmental organisations, in environmental and water management (Dublin Statement on Water and Sustainable Development 1992; Hague Declaration 2000; Noordwijk Statement 1994; Sofia Guidelines 1995). In 2001, the Bonn Declaration stated that '[w]ater resources management should be based on a participatory approach. Both women and men should be involved and have an equal voice in managing the sustainable use of water resources and sharing of benefits.' These documents strongly recommend the management of water at the lowest appropriate level and the need to involve people in the management and governing decisions concerning water resources.

The most significant development in the realm of water law is the Berlin Rules on Water Resources (International Law Association 2004) adopted by the International Law Association, a non-governmental organisation. The Berlin Rules, a non binding instrument, summarises the customary international law related to water and takes into account both national and international waters, recognising a right in customary international law of public participation in the management of water resources (Dellapenna 2006). Various provisions set forth the right of public participation (International Law Association 2004: arts. 4, 17–21, 30, 69–71) and the Rules recognises a duty of states to take steps to ensure public participation in the management of waters (art. 4). The Rules adds that people should be 'able to participate, directly or indirectly, in processes by which those decisions are made and have a reasonable opportunity to express their views on plans, programmes, projects, or activities relating to waters' (art. 18). The Rules emphasise the right of the people to access information in order to participate in the governance of waters (art. 18), to participate in transboundary environmental impact assessments (art. 30), and right to have effective administrative and judicial remedies (art. 70). This document is heavily influenced by the developments in international human rights law (e.g., General Comment 15) and international environmental law (e.g., Agenda 21 1992; Aarhus Convention 1998).

21.2.2.1 International Environmental Agreements

Provisions on public participation relating to water policies and projects are found in international agreements on biodiversity, climate change and desertification. They call on Member States to encourage multi-stakeholder involvement during processes to co-ordinate the implementation of multilateral environmental agreements because non-governmental organisations, the private sector, and civil society can use their networks to build capacity and increase public awareness. By involving civil society in policy making, governments become better informed on the issues affecting the local communities and ensure that diversity is reflected in all policies. Examples of some of participatory provisions are as follows:

- The Ramsar Convention (1971) and its Strategic Plans urge Parties to consider representation of local and indigenous people on the National Ramsar Committee and in the national delegations to Conference of Parties. Several implementing resolutions seek to strengthen participation of civil society, local communities, and indigenous people in the management of wetlands.
- The Convention on Biological Diversity (1992) establishes a comprehensive regime for the conservation of ecosystems and biological resources and is linked to water resource management. Its preamble affirms the need for the full participation of women in policy-making and implementation of the convention. In its work programme on inland waters biodiversity, it refers to involving local and indigenous communities in development and management plans and in projects that might affect biodiversity.
- The Parties under the UN Framework Convention on Climate Change Convention (1992: art. 4(1)(e)) were asked to develop 'appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification as well as floods.'
- The Desertification Convention (1994: art. 2(2)) provides that affected areas require long-term integrated strategies. Government, communities, non-governmental organisations, and landholders need to work in partnership, and establish a better understanding of the nature and value of land and scarce water resources in affected areas (art. 3(c)). Parties should also promote cooperation among affected Parties in the fields of environmental protection and the conservation of land and water resources, as they relate to desertification and drought (art. 4(2 (d)). Regional Action Plans should promote exchange of information and appropriate techniques, technical know-how in water resources development (art. 13).

21.2.2.2 Regional Environmental Agreements

A unique development in public participation is the Aarhus Convention (1998), a convention developed by the UN Economic Commission for Europe, but open to accession by any UN Member State (with the approval of the parties) (art. 19(3)).

It is dedicated exclusively to participatory rights. The Convention provides, without discrimination as to citizenship, nationality or domicile, for: access to environmental information held by public authorities (art. 4); public participation in environmental decision-making from an early stage (arts. 6–8); and the right to challenge public decisions adopted in violation of environmental laws in court, particularly in violation of the rights of access to information and participation in decision-making (art. 9). These provisions would allow public participation in preparing plans and programmes on water resources management and would be useful in challenges to management or utilisation decisions for water resources. The list of covered activities (Annex I) includes: inland waterways and ports for inland-waterway traffic; groundwater abstraction or artificial groundwater recharge schemes; works for the transfer of water resources between river basins; and dams and other installations designed for the holding back or permanent storage of water.

Other regional conventions for Europe include the Helsinki Convention (1992) and its Protocol on Water and Health (1999), which form a legal framework in the field of water management and the protection of human health and safety. The Helsinki Convention covers public information, while the Protocol stipulates broader rights on public information and public participation. Moreover, the Espoo Convention (1991: arts. 2, 3, 6) provides that public in the areas likely to be affected should be able to participate in an environmental impact assessment on the proposed activities. These provisions were strengthened in the Kiev Protocol on Strategic Environmental Assessment to the Espoo Convention (2003: art. 4, Annexes I, II).

21.2.3 Public Participation in River Basin Management

While 145 countries share 263 international river basins (Giordano & Wolf 2003), most water basin agreements do not have any provisions on public participation (Milich & Varady 1999). Some of the more recent transboundary water arrangements do include participatory provisions. For example, the Environmental Programme for the Danube Basin (1991) explicitly includes the principle of 'public participation'. Although previous international agreements for the Danube basin were entirely closed, public participation was actively solicited throughout the planning process that led to the Environmental Programme (Bingham et al. 1994). The ensuing Danube Convention (1994: art. 14) did not include any specific provision on public participation, it did include a provision requiring competent authorities of Member States to provide information to any natural or legal person 'with payment of reasonable charges, in response to any reasonable request, without that person having to prove an interest, as soon as possible'. Similarly, the Nile Basin Initiative (1999) encourages the dissemination of relevant information and the involvement of a broad range of stakeholders. Some critics, however, have described the Nile participatory provisions as mere 'window dressing' (Pottinger 2004).

The Mekong River Basin Agreement (1995) does not include any provision on public participation, but a separate policy document identifies activities where

people could be involved: information gathering, information dissemination, consultation, and participation culminating in some level of decision-making. This separate document perhaps reflects international and national protests over decisions relating to the river (Green Cross International 2000). The Río de la Plata Basin Treaty (1969) used a 'top-down' approach with no role for either public or local government participation (World Water Assessment Programme 2007), yet 30 years later the Pantanal and the Upper Paraguay River Basin Project (2004), funded by the UN Environmental Programme, adopted a comprehensive participatory approach through a wide range of modalities. It includes direct participation in project design, the execution of demonstration projects and studies, recruitment of local expertise for the project activities as well as dissemination of information and project results.

Such regional basin-level agreements show that participatory provisions mainly consider the participation of non-governmental organisations in the consultative process and provide a link between local political authorities and national policy makers. Moreover, while the basin management treaties do not always contain provisions on public participation, projects specific to sustainable management linked to the same water body may contain provisions on public participation. These examples also show that participatory practices may be common at the local level, but the outcome of the consultation may not be communicated at the national level due to a lack of structured participatory mechanisms.

In bilateral agreements, mechanisms rarely exist for public participation in the decision-making processes that result in the creation or implementation of river basin treaties. For example, the Ganges Treaty (1996) between Bangladesh and India does not include any provision on private or public sector involvement. On the other hand, the 2004 Agreement for the Protection and Sustainable Development of Lake Ohrid between Albania and Macedonia includes provisions for active participation of civil society in watershed management. In some cases, public protests and demonstration remain the only way to show popular dissatisfaction with a plan or project linked to transboundary water. Thus, a large demonstration in early 1998 in Budapest opposed the completion of Hungary's part in new Hungarian-Slovak projects on the Danube River, proposed to settle the two countries' long-lasting dispute over the Gabcíkovo-Nagymaros hydroelectric project (Fürst 2003). Another example is the mass protest in Bangladesh against India's plan to link major international rivers with canals and to construct reservoirs to store water for use in farming in the dry season (Vidal 2003).

21.2.4 Summary

Public participation, as a political right, is a cornerstone of democracy. Examples of recent development of public participation can be found in impact assessment laws of the 1970s. Thereafter, the right of public participation has been greatly influenced by the concept of sustainable development of the 1990s (Ebbesson 1997;

Pring & Noe 2002). The Aarhus Convention (1998) defines the right of public participation as including the right to information, public participation in the decision-making, and access to justice, with as shift from reactive participation to active participation at the local level and a collective management of shared water resources. A large number of international and regional documents include detail provisions on public participation in the decision-making accompanied by rules on access to information and legal remedies. Participatory provisions in international instruments contain provisions to involve people actively in all aspects of policy-making, implementation, and post-project monitoring. The general public must have an opportunity to 'voice' their views, adequate and timely access to the necessary information, an opportunity to participate in the environmental impact assessment, and adequate access to means for enforcing the law directly to prevent or recover damages for harmful activities. Such participatory provisions are found in non-binding documents, and multilateral conventions and protocols, a few bilateral agreements. These instruments reflect concerns about economic efficiency, participatory democracy, collective action, common property resources, and integrated water resources management (Bruch et al. 2005).

21.3 Participation in Domestic Water Management

This part assesses the interplay between law and institutions at the national level and the influence of people on policy- and decision-making. Instead of discussing any particular jurisdiction or legal instrument, this part surveys the main approaches that have evolved, influenced by international legal instruments, national implementation plans of international environmental agreements, and national water policies. At the domestic level, formal and informal forums are available for public participation. Participatory rights may be guaranteed in the Constitution and in water-specific legislation, while laws may allow the public to bring public interest litigation in a formal tribunal. In addition, people can follow a wide range of informal ways to participate in the decision making process: organising protests, non-governmental organisations and community coalitions for political bargaining, and effective use of the media.

21.3.1 The Influence of International Policies

Development of national level water law and policies has been influenced by the targets set in international goals (e.g., United Nations 2000), commitments made in non-binding declarations (e.g., Johannesburg Declaration on Sustainable Development 2002; Rio Declaration 1992), and other international initiatives (e.g., WEHAB 2002). To achieve these goals, governments need water plans and policies that have the active participation of the communities. The Plan of

Implementation of the Johannesburg World Summit (2002: ch. II, ¶7(d)) urges national governments to 'promote women's equal access to and full participation in, on the basis of equality with men, decision-making at all levels'. The Plan of Implementation (ch. IV, ¶25(b)) also asks the governments to: 'facilitate access to public information and participation, including by women, at all levels in support of policy and decision-making related to water resources management and project implementation.' Along with such non-binding international legal instruments, there are binding international agreements that prioritise public participation at the national level. The World Heritage Convention (1972), Convention of Biological Diversity (1992), UN Framework Convention on Climate Change (1992), and the Desertification Convention (1994) all propose involvement of communities at national level plan and programmes. A lack of coordination among public agencies at the national level, however, makes participation in the preparation and implementation of the national plans of these agreements.

21.3.2 Public Participation in Domestic Water Management

At the national level, participatory rights can be built into general laws, as well as into specific environmental legislation or other specific laws. General laws may provide formal or informal or quasi-judicial forums for legal redress. In addition, they outline procedural issues such as standing in public interest litigation or class action and legal aid. Sectoral legislation may provide separate mechanisms for people to participate in impact assessment procedures. The effectiveness of public participation is directly related to the information available, bringing into play national freedom of information laws (Coliver 1993).

In some countries, public participation is a common theme in water resource management policies (Razzaque 2008). For example, the National Water Policy of Bangladesh (1999) requires participation of local communities necessary for water sector development projects and in the planning and management process (Akhter 2005). The National Water Policy of India (2002) encourages participation of communities in the planning, development, and management of water resources projects. The Water Policy of Pakistan (2004) calls for an enabling environment for active stakeholder consultation and participation at all levels and in all aspects of the water sector including irrigation, drainage, rural water supply, flood protection, and drought activities. Similar examples could be brought from the African and Latin American, where 'public participation' has become the new watchword in national water policies (Food & Agricultural Organisation 2001). Despite these national policies, people rarely participate, raising a question as to whether these policies are adequately implemented (Nicol & Mtisi 2003).

Constitutions of several countries include a specific right to water or (more commonly) a right to a safe or healthy environment (Constitution of Cambodia 1993: art. 59; Constitution of Eritrea 1996: art. 10; Constitution of Ethiopia 1998:

art. 90(1); Constitution of Gambia 1996: art. 216(4); Constitution of Laos 1991: art. 17; South African Bill of Rights 1996: §27; Constitution of Uganda 1995: art. 14; *see generally* Scanlon et al. 2004). Additionally, many water-specific laws include provisions on public participation (Dubreuil 2006; Krchnak 2005). These laws generally promote participation by local governments and communities in water resources planning, management and preservation. People can bring an action in the domestic courts for any breach of these constitutional or legislative rights. Public interest litigation is one of the legal mechanisms that allow individuals and or groups to vindicate the 'public interest', seeking redress for injury to the public in general. Examples of public interest litigation can be found in Africa, Asia, and Latin America enabling poorer sections of the community to access to courts (ELAW Legal and Scientific Resources 2008).

The Indian judiciary has taken a lead role, appointing commissions of enquiry, monitoring its own directions, initiating *suo motu* proceedings (without a complaining party), supervising implementation of its orders, and awarding compensation to the aggrieved (Razzaque 2004a: ch. 5). Since the 1980s, the Indian Supreme Court has considered water pollution, encroachment of riverbed, mining and water management (Rosencranz & Divan 2001). Such public interest litigation can be against public authorities or the company. A Kerala *panchayat* (local village council) took Coca Cola to the Supreme Court to stop them from drawing local groundwater for its bottling plant for infringing the community's right to water. The High Court of Kerala held that the *panchayat* should renew Coca Cola's license, but limit the quantity of groundwater they could withdraw. The Supreme Court agreed to this decision of the High Court and asked the *panchayat* to renew the license. The *panchayat* renewed the license for 3 months with condition that the company shall not use groundwater for industrial purposes, including for producing soft drinks, aerated carbonate beverages, or fruit juice (Venugopal 2006). The company decided to move their business to another site.

In contrast, while the British judiciary is willing to hear arguments from established environmental groups (Castle et al. 2004), it has expressed concern that the cost of judicial review can be 'prohibitively expensive' and does not meet the requirements of the Aarhus Convention (1998) (Working Group on Access to Environmental Justice 2008). Within the European Union more generally, increased recognition of procedural rights is reflected in the White Paper on European Governance, which identifies a need for more transparent and understandable decision-making at the Union level and for stronger interaction with the local governments and civil society (Commission of the European Communities 2001). The Union has promulgated legislation dealing with procedural requirements to include people in the decision making process. The legislation is binding on the 27 Member States and they have an obligation to implement these Directives at the national level within a given timeframe. The Water Framework Directive (2000: art. 14) requires Member States to list contact points and procedures for obtaining information in order to 'encourage the active involvement of all interested parties in the implementation of this Directive, in particular in the production, review and updating of the River Basin Management Plans' and '[u]pon request, access shall

be given to background documents and information used for the development of the draft River Basin Management Plan' (Lanz & Scheuer 2001).

The European Union's Directive on Strategic Environmental Assessment (Directive 2001/42/EC 2001: arts. 6, 7) further states that the public, along with relevant government agencies, must be given an early and effective opportunity to comment on the draft plan or programme and the accompanying strategic assessment report. The Union also adopted a Directive concerning public access to environmental information reflecting the first pillar of the Aarhus Convention (Directive 2003/4/EC 2003) imposing strict obligations upon Member States regarding dissemination of environmental information by public authorities and extending the right of access to information to any person, regardless of residence. The European Commission has also adopted a proposal for a Directive to address the requirements of access to justice in environmental matters by people within the EU (Razzaque 2005).

Despite such developments, large infrastructure projects (including dams) in the developing countries remain an area where people rarely have a voice. Some dam projects have been pushed through by the central authorities without any public consultation (World Commission on Dams 2000) and where the authorities disregarded public outcry (e.g., the Sardar Sarovar project in India—Friends of River Narmada 2006; the Three Gorges Dam in China—Bartolome et al. 2000); the Itoiz Dam in Spain—World Wide Fund for Nature 2004). The World Commission on Dams urges national governments to identify the broad range of stakeholders potentially affected by the dam and ensure their informed participation in the planning and implementation processes, a shift from the traditional exclusive focus on economic and technical aspects rather than social and environmental concerns alienate affected communities from the project (World Commission on Dams 2000).

Another area of concern is the privatisation of public services, such as water services. If the privatisation process does not include effective regulation and if people are not effectively involved in the decision- or policy-making process, it can lead to social protests (Budds & McGranahan 2003). In Latin America, on at least three occasions (Argentina's Buenos Aires and Tucumán Provinces and Cochabamba in Bolivia), the governments had to terminate the operators' contract and take the water service back into public sector because of public protests (Razzaque 2004b). The leading example arose in Bolivia when granted a long-term contract to supply water to Cochabamba to Aguas del Tunari, a subsidiary of the UK based International Water Limited, a multinational company. The company obtained rights not only to supply water to the municipality's network, but also for industrial, agricultural and residential uses in all of Cochabamba province. Collection of rainwater—part of customary practice of the people of Cochabamba—became subject to a permit system. In effect, all rights to access water in Cochabamba were transferred to Aguas, which promptly increased water tariffs up to 200%. The resulting violent protest forced termination of the contract (Razzaque 2004b). This example shows an ongoing struggle between the commodification and the human right to water (see Chapter 1, Gupta and Dellapenna, this book).

Marches, protests, campaigns, payment boycotts, illegal connections, and litigation—all are participatory tools used to influence the policies of the government.

In addition to getting the concession terminated, examples of local opposition that have delayed or made the government cancel the privatisation contracts are abound (Hall et al. 2002, 2004). The question is whether these protests lead to an alternative model of water management that is effective and sustainable. In Bolivia, when the water service reverted back to the public authority, the new management of water services involved members of the civil society, but there were many setbacks in the process, including internal disagreements and power-struggle in the coalition (Morgan 2006). Therefore, the impact of such social protests on the policy-making level remains uncertain, with success of a protest largely depending on the political history of the country and the level of community empowerment in that country, the system of governance, the political culture, the availability or lack of information on a project, and communities' access to justice. Moreover, protest may not connect the strategy of one particular group to another, and it may not even engage the national political dynamic. The level of public participation also depends on the fiscal structure of the state, on Constitutional commitments, on access to adequate information, and on strong civil society. In the end, only a powerful social group can influence the policy-making process.

21.4 Conclusion

For public participation, the 1990s were eventful, with a large number of binding and non-binding instruments developing elaborate various participatory tools and techniques. While developing countries are not parties to the Aarhus Convention (1998), the influence of other binding (e.g., human rights and environmental treaties) and non-binding instruments clearly have impacts as countries implement these instruments and international financial institutions incorporate them into their policies. Public participation requirements are increasingly attached to loans and financing by international financing bodies (Razzaque 2004a). Treaties require access to information, participation, and accountability for their implementation. Yet national policies often allow participation of communities at a later stage of project- or policy-development and include inadequate provisions on the dissemination of information. Policy-level weaknesses (e.g., a narrow definition of consultation, technical language, restricted scope for participation) severely affect communities' right to participation. Only a coherent participation policy guaranteeing timely and effective participation and proper consultation procedure through impact assessments could ensure procedural justice.

In addition to weak policies, several institutional and legislative factors hinder effective participation at the local level: resistance by local governments; lack of effective procedures; weak regulatory provisions; lack of interest on the part of the public due to lack of information; lack of trust between various stakeholders; and lack of free and accessible information. Some tools have evolved to manage water efficiently, including basin-based management, integrated water resource management, public participation in the policy-making, and accessible courts. Success of the

participatory tools, however, lies with the goodwill of political institutions to enforce the rules. At the same time, participatory mechanisms have created some specific trends. One trend is an international emphasis on local level participation in water policy- and decision-making. Since the 1970s, international treaties to protect the environment and human rights encourage governments to involve local communities, encouraging a shift from the traditional 'top-down' to a 'bottom-up' approach.

When international organisations promote private sector participation and development assistance funds depend on the privatisation of resource sectors (e.g., dams or water services), they undermine the capacity of local governments to resolve their own water issues (Bond 1997) or to negotiate independently with the multinational companies. International financial bodies should not underestimate the negative impact public protests may have. Public protests continue to destabilise the contractual environment for global water companies in ways that generate the most extreme response of all: disinvestments and international arbitration of claims for compensation. The World Bank itself has had to withdraw a loan amidst public protests against an infrastructure project (e.g., the Sardar Sarovar dam in India, Ilisu in Turkey—World Commission on Dams 2000). While it may be possible for the community groups to challenge the privatisation decision of the government in national courts, there are limited participatory tools available for communities to go to international tribunals challenging the water privatisation contract. Communities do not have any right to bring an action in the ICSID. Conversely, the dispute settlement mechanism established under the North American Agreement on Environmental Cooperation (1993: arts. 14, 15) allows any 'interested party' to initiate direct action against governments that are felt to be not enforcing their own environmental regulations, although the remedies are not entirely satisfactory (Fitzmaurice 2003). At the same time, several regional courts and tribunals (e.g., European Court of Human Rights, Inter-American Court of Human Rights) that allow individuals or groups to come to the court if they are victims of any violation (Fitzmaurice 2002). Non-governmental organisations may also submit *amicus curiae* briefs during the written procedure and, in some cases, take part in oral hearings (Fitzmaurice 2003).

Another trend is the crucial role played by the civil society in water disputes. If civil society is not integrated within the political system, public bodies remain unaccountable and their agendas lose any political edge. At the international and regional level, especially in the human rights and environmental forums, non-governmental organisations are active in the law and policy making process. They create a common platform to share experience and mobilise groups to follow similar strategies, thus creating a possibility for larger coalition within a country or across a region. For example, in both South Africa and New Zealand, activist groups have mobilised to engage in deliberate strategies of mass non-payment (Morgan 2006). Sharing similar experiences can enrich 'public participation'. For example, the Mekong River Commission has drawn upon the lessons learned from the Murray–Darling Basin Commission in formulating the Mekong River Commission's public participation strategy (Bruch et al. 2005). Dialogue between community groups, multinational companies (or the service provider), and the

government (local and national) is necessary (Dubreuil 2006; Rogers & Hall 2003; Smith 2004). The question is not how to bring these groups together for negotiations, but how to assess the success of such negotiations.

Water governance promotes an enabling environment with participation from all sectors—private and public. The key element of participatory governance is to create an administrative and institutional framework where people can participate freely and agree to co-ordinate their actions. At the international and national level, government, private sectors and non-governmental organisations need to work together to manage water resource and coordinate efforts to balance the economic, political, and social needs of the society.

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Chapter 22
The Market Alternative

Joseph W. Dellapenna

Abstract Water generally has been regarded as a 'free good', available for use by anyone with access to it. Because the water can be used multiple times, water traditionally has been a 'public good', held by the community, either as common property or as public property, although rights to make particular uses of water might be assigned to particular persons to promote social and economic stability. Markets never were used to manage water on a large scale. Only late in the twentieth century did a large number of influential people advocate markets for raw water as a primary management tool. The pressure to rely on markets as the primary tool for managing water produced intense controversy because reliance on markets ignores water's public or shared nature. This chapter recounts the rise of and resistance to markets as the water management tool, concluding that markets, at best, can only play a limited, marginal role in water management.

Keywords Markets • market advocates • property • public good • public water systems • transaction costs

22.1 Introduction

Water generally has been regarded as a 'free good', provided by nature so that anyone with access to a water source can use it. This attitude arises because water is ubiquitous, mobile, and renewable. These qualities allow multiple uses of the same water: The water you use today is the water I use tomorrow and vice versa. As a result, water traditionally is a 'public good', held by the community, either as common property or as public property (Dellapenna 2000; Kaul et al. 1999). The only costs, if any, associated with water as a public good are the costs of capture, transportation, delivery, and disposal, not costs for the good itself. Yet water is also

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highly variable and uncertain in both quantity and quality, leading to assignment of a right to make a particular use of water to a particular person in order to provide social and economic stability. Even with such assignments, however, others cannot be excluded from using the resource (Cowen 1992). As a result, efficient management of public goods is problematic: If one invests in developing or improving a public good, others who invest or pay nothing ('free riders') will benefit from the investment because they cannot be excluded. This seriously inhibits investment unless the community takes responsibility for ensuring that all (or nearly all) pay for the benefits they receive. Otherwise, as demand approaches supply, users will be locked into a 'tragedy of the commons', destroying the resource (Hardin 1968).

Sometimes, as in Islam, the view of water as a public good is expressed in religious terms—water is the gift of God, over which no person may exercise ownership (see Chapter 3, Naff, this book). As Islam demonstrates, this is not just an indulgence in wetter climates where water is seldom in short supply. Islam is a religion of the desert; the very word *shari'a*, the name given to Islamic law, generally translated as 'the path to salvation' or 'the path to God', literally means 'the path to water' (see Chapter 3, Naff, this book). Yet even under *shari'a*, there could be privately held rights to water based on one's investment of money or labour: One who digs a well owns it and can, in general, control access to it. Yet even the well owner cannot deny water to quench a person or animal's thirst so long as the owner's needs are met (ben Adam 1967: 72). And in most schools of *shari'a*, it is forbidden to sell water even when one owns it (ben Adam 1967: 72; Mawardi 1983: 321).

Roman law embraced the same principle. Roman law recognized three aspects to property: *usus*; *fructus*; and *abusus* (*Corpus Juris Civilis* 535: Digest 535: tit. 7). One who held complete title to property held rights to use the property (*usus*), to the fruits of that use (*fructus*), and to waste, damage, or alienate the property (*abusus*). Where one held *usufructuary* ownership, one could use the property and enjoy its fruits, but could not waste, damage, or alienate it. Such a limited property right was called a *usufructuary* right. From Roman times down to today, the Roman law tradition—and the common law tradition—have described water rights as usufructuary (*Portage County Board of Commissioners v. City of Akron* 2005: 490, 493; *Succession of Brassette v. Armand* 2000: 818), clearly indicating that water rights cannot be bought or sold.

Given the impact of the Islamic, Roman, and common law traditions globally, in most parts of the world there simply was no right to market water in its natural condition. And we find, in most, if not all, ancient societies in which large scale water management is necessary, management of water was a governmental or social responsibility. This was so central to some societies that some historians have concluded that such 'hydraulic' societies gave rise to highly centralized, autocratic regimes (Teclaff 1967: 15–25, 28–32, 42–47; Wittfogel 1957). While in many instances over the centuries water was sold, particularly in urban environments, to individuals for their personal consumption, these sales nearly always involved small quantities of water compared to the overall water budget of the society, nation, or region (Murray 1875: 33). Markets simply never were used to manage water on a large scale, particularly when that water was still in a natural source. This tendency became even more pronounced

in the late nineteenth and twentieth centuries when large public or quasi-public institutions were created to deliver water to individual users (Gleick et al. 2002: 29).

Only in second-half of the twentieth century did a large number of influential people advocate the marketising of water as the primary water management tool. Such advocates often held the view that markets are always a superior way for managing the economy, and that markets should always be used to allocate resources and to distribute wealth within society, indeed to resolve all or nearly all social questions (Bethell 1998; Levitt & Dubner 2005; Nelson 2001). This position is called 'neo-liberalism' outside the United States. Market advocates initially appeared to achieve considerable success in the privatization of water utilities and in attempts to create markets for raw water—water in its natural state. The pressure to rely on markets as the primary tool for managing water, however, produced intense controversy (Rothfeder 2001). This chapter recounts the history of the rise of and resistance to markets as the water management tool.

22.2 The Rise of the Market Advocates

Economists and others began advocating the virtues of markets for managing water in the late 1970s (Anderson 1983). The rise of the Thatcher administration in the United Kingdom and the Reagan administration in the United States gave the two countries receptive governments (Gamble 1994; Kymlicka & Matthews 1988). The market theories also arrived at a time of growing crises relating to the financing of safe water and suitable sanitary services (Gleick et al. 2006; UN Environmental Programme 2002: 151–210). Markets seemed to offer a nearly painless way to raise the necessary funds to address these escalating problems. The propositions soon became the 'Washington consensus', embraced by the U.S. Treasury Department and other branches of the US government and by the World Bank group and the International Monetary Fund (Baker 2005). The Bank and the Fund are located directly across the street from each other in downtown Washington, a few blocks from the U.S. Treasury. The international organizations have always been dominated by the United States through voting weighted according to financial contributions to the two institutions (Krisch 2005). From the 1980s onward, these institutions collaborated in pressuring countries to adopt market systems for water and issues.

The Washington consensus got its first big test with the collapse of Communism in Eastern Europe between 1989 and 1991. With the advice of numerous American economists funded by the Washington institutions (Gianviti 1997), the newly freed countries underwent a 'shock treatment' intended to convert them in the shortest possible time from nearly totally planned economies to nearly totally free market systems (Klein 2007). The process used to privatise the former Communist economies produced a great deal of corruption that generated enormous wealth for few well-connected former *apparatchiks*, a great deal of impoverishment and social unrest for the rest, and the resurgence of left-wing political movements (Heller 1998; Simon 1995). The move to markets did have real benefits, despite the social

costs, and many of the problems eventually were worked out or ameliorated (Yergin & Stanislaw 1998). Even the People's Republic of China, where the Communist Party remained in power, became a free market economy with spectacular results, but also with spectacular social dislocations (Mushkat 2005). Such was the depth of belief of the market advocates, however, that whatever the problems and however deep the crisis, they had only one response—let the market take its course (Gianviti 1997: 777). Thus when economies across East Asia melted down in the late 1990s, the Washington institutions insisted that the market be allowed free play, only deepening the crises (Haggard 2000). This pattern continued as similar meltdowns occurred in other countries on other continents (Mugasha 2007).

Ronald Coase's article, *The Problem of Social Cost* (Coase 1960), which was part of the reason that he won the Nobel Prize in Economics, is taken as explaining the superiority of markets (Anderson 2004; Parisi 2003; Ruml 2005). Coase famously demonstrated that a private-property market system is the most efficient mechanism for allocating resources to particular uses when it works and that the particular legal rules applied to disputes over resources will not affect how resources are allocated so long as markets work. This is referred to as the 'Coase theorem'. Coase did not stop at this point, but went on to stress that markets fail when there are significant barriers to their functioning. Coase would later note that economists who ignore basic concerns about why markets succeed or fail are practicing 'blackboard economics' (Coase 1988: 1–20). The most important simplifying assumption that 'blackboard economists' make is to assume a 'frictionless market'—a market without transaction costs (Coase 1988: 13–15, 174). This assumption is the key to understanding the problems with attempts to apply markets to water resources (Cooter & Ulen 1988: 100–101; Komesar 1994: 19–26).

22.3 Applying Market Principles to Water Resources

Market advocates have preached for several decades that markets are the best method for managing water resources (Anderson 1983; Anderson & Snyder 1997; Kumar & Singh 2001; Lee 1999: 53–87; Young & MacDonald 2003). Economists working for the Washington consensus institutions particularly favour such proposals (Dinar 2000; Rosengrant & Binswanger 1994; Teerink & Nakashima 1993). As a result, those institutions have strongly pressured governments in need of their support to improve or maintain their water infrastructure to introduce markets (Naegele 2004: 108–112). Markets do play a role in the exploitation of water resources in the real world, but in a much more limited way and on a much smaller scale than market advocates contend (Dellapenna & Draper 2004). Even dramatic legal reforms meant to facilitate the emergence of markets for water have had remarkably little impact. Proponents of markets for water resources prefer to discuss the theory of markets rather than to consider what actually happens when market principles are enacted for water resources. This section briefly recounts the actual experience with the application of market principles to water management, beginning with perhaps the simplest example—the privatisation of water utilities—and then to attempts to apply market principles to raw water—water resources in their (more or less) natural state.

22.3.1 The Privatisation of Water Utilities

Since the late nineteenth century, water delivery within municipalities has been a public service, usually provided by entities operated under public ownership or close public supervision (Gleick et al. 2002: 29). Even today public bodies provide 90% of water utility services in the developing world (Petrova 2006: 577). These entities often undercharged for their services and found it increasingly difficult to make-up the financial shortfall with a public increasingly resistant to paying taxes (Budds & McGranahan 2003: 97–98; Fauconnier 1999: 37–46; Naegele 2004: 107; Rajarman 2006). As the twentieth century drew to a close, municipalities across the globe turned to privatization, often seeing that as the only means available for securing new capital in an era of tight public budgets (Gleick et al. 2002: 23–24; Bakker & Cameron 2005; Danesi et al. 2007; Jones & Duncanson 2004).

Proponents of privatization argue that private operators are more efficient and would improve the quality of service even while reducing costs (Budds & McGranahan 2003: 100; Kerr 1995: 92–93; Petrova 2006: 587–588). The World Bank is so convinced that between 1996 and 2002 it conditioned one-third of its water-related loans on the privatization of water utility services (Kerr 1995: 91–92; Petrova 2006: 583–586). Yet privatization of water utilities has proven more problematic than its proponents predicted or acknowledged (Braadbaart 2005; Chatila 2005; Hukka & Katko 2003). For the most part, privatized water utilities did not perform better than the publicly owned utilities they replaced (Clarke et al. 2004; Estache & Rossi 2002; Petrova 2006: 588–591). Prices often rose precipitously immediately after privatization, sparking riots and other resistance that succeeded in many parts of the world (Formiga-Johnsson et al. 2007), most famously in Cochabamba, Bolivia in 2000. After the World Bank pressured Bolivia into privatizing its water services, the company that had won the concession of the Cochabamba waterworks was forced to abandon it (Rothfeder 2001: 99–114; Naegele 2004: 124–126; Nickson & Vargas 2002; Petrova 2006: 579–580; Price 2007). The leader of the riots at Cochabamba, Evo Morales, went from a leader of coca growers to President of the country in 2006 (Rockefeller 2007).

Less dramatic resistance also succeeded in other countries (Hukka & Katko 2003: 35, 55–65; Kuks 2006; Petrova 2006: 579–580; Symposium 2005). In the United States, the market advocates succeeded for about a decade until a backlash set in. Today some parts of the United States now have laws and regulations to block the marketisation of public water services (Arnold 2005). More dramatically, some communities have bought backwater utilities that were privatized a decade or less earlier because of the inability of the private utility to provide satisfactory service at a reasonable cost (Connally 2003; Haner-Dorr 2003; Snitow & Kaufman 2007). These utilities were privatized on ‘favourable terms’ in order to attract a buyer, but were bought back at prices reflecting the full value of the business enterprise (Stamper 2003). The most prominent example of failed privatization was Atlanta, Georgia. The city, in serious financial difficulties in 1998, decided to privatize a water and sewer service that had been under municipal ownership for 123 years (Hairston 1998a; Powers 1998). The system served about 1,500,000 people in the greater Atlanta area, making it the largest to be privatized in the United States and one

of the largest in the world. There was little public opposition to the proposal. Atlanta selected United Water as lead contractor, which shortly sold its interest to its French partner, Suez Lyonaise—one of the largest water service companies operating worldwide (Associated Press 1998). Atlanta officials were so pleased that they expected the arrangement to become a model across North America (Campos 1998).

The winning bidder faced trying to collect on as much as U.S. $30,000,000 in unpaid water bills, while performing neglected maintenance and undertaking major upgrades to the system (Hairston 1998b). The contractors announced sewer rate increases nearly equal to those threatened by the city in order to promote privatization, although promising to make up that increase by reducing water delivery rates (Hairston 1998c). Soon after, the cost of water delivery began to rise and the illusion of improved service at lower cost vanished (Hairston 1999; Hardie 1999). Less than 5 years after Atlanta privatized its water system, the city bought the system back at considerable financial loss, hoping to improve service and rein in costs (Bennett 2003; Ippolito 2003; Jehl 2003).

The problem is not simply that Atlanta made a poor contract, something that better negotiating could have prevented. With an obligation to provide water even to those who cannot pay the cost of the service and huge capital demands for providing water service to large populations, the overall rate of return on investment is not high enough to attract the capital necessary to provide improved service at lower cost even for those expected to pay full price for their water services (Gleick et al. 2002: 29–40; Hukka & Katko 2003: 89–98; Petrova 2006: 585–588; Winpenny 2003). These problems and setbacks did not stop the pressure to privatize water utilities, including both water distribution and wastewater treatment (Estache & Trujillo 2003; Jones et al. 2006; K'Akumu 2006; Magee 2005; Windahl 2006; Winpenny 2003). The resistance to markets forced a turn to 'public–private partnerships' as the next best alternative (Budds & McGranahan 2003: 88–90; Fauconnier 1999: 43–44; Petrova 2006: 585–586). Greater public involvement might make these partnerships work better, but there are no guarantees.

22.3.2 Markets for Raw Water

Markets for raw water have always been rare in practice and those that exist involve relatively small amounts of water sold among similar users within a localised geographic setting, often among shareholders of a mutual ditch company or the like (Fullerton 2006; Gomez & Loh 2008: 696; Howe & Goemans 2003; Thomas & Mueller 2008: 745–748; Zaman et al. 2005). Water markets have seldom been used to accomplish significant changes in the ways water is used. Terence Lee summarized the result thusly, 'The idea of treating water as an economic good … is so novel that using markets, rather than bureaucratic decision, for water allocation makes almost everyone responsible for water policy very nervous' (Lee 1999: 78). Indeed, when markets for water become a subject of public concern, the debate

often becomes highly emotional, often against markets. The dearth of real markets gives rise to a question: If markets for raw water are so good, why are they so seldom used? Elsewhere, I have written at length about the available models of property in water and the attempts to marketise raw water and why they fail, and I will only briefly summarize the key point here (Dellapenna 2000).

Transaction costs are the key to why markets fail for raw water. While it is easy enough for someone to own and manage water in small amounts (for example, bottled water), a river or the like is an ambulatory resource that can never be fully controlled or owned. Even a dam only delays the flow of the water; it cannot stop it altogether. Doing something to water on a large scale necessarily affects many others, making it difficult to make contracts with all significantly affected holders of water rights: Transaction costs on all but the smallest streams, lakes, or aquifers, quickly become prohibitive (Chakrvorty et al. 1995; Howe et al. 1990). The case of *City and County of Denver v. Fulton Irrigating Ditch Company* (1972) illustrates the problem. The Adolph Coors Company agreed to trade the brewery's 'clear mountain stream' to Denver for the right to use unlimited amounts of sewage water for its brewery. The transaction failed because a group of farmers (organized as the Fulton Irrigating Ditch Company) obtained an injunction against it because it would deprive them of the water on which their water rights depended. In an earlier dispute, the farmers had recognized the seniority of Denver's rights over their own, yet courts do not allow transactions if they would adversely affect the rights of even junior third parties.

The outcome in *Denver* is ordinary law in most parts of the world. Market advocates sometimes decry protection for third-party rights as resulting from an overly rigid legal regime that should be changed to allow markets to flourish (Gomez & Loh 2008: 697; Thomas and Mueller 2008: 754–756). Rather than improperly precluding markets, however, protection of third-party rights prevents market-generated externalities from destroying the property rights of the third parties. Rather than preventing or distorting markets, such protections are the minimum necessary to ensure that every person's property rights are transferred only through markets (Posner 2007: 77–78). Recognition of third-party rights prevents functioning markets except on a small-scale and then only if there are to be no major changes in where or how water is used—as has historically been the case.

Market advocates are right to insist that economic incentives should be used to force water users to evaluate the social consequences of their conduct more realistically (Backhaus 1999; Dinar & Subramanian 1997; Tippett & O'Hare 1999). Recourse to economic incentives should not obscure the fact that water remains the prime example of a public good for which prices realistically cannot be set in a marketplace. Even extreme market advocates use water metaphors to describe the few public goods that they recognize, such as 'common pool resource' and 'spill over effects'. Yet market advocates hardly mention the public nature of water and barely consider the transaction costs inherent in treating water as a private good, taking us back to 'blackboard economics' without connection to social and economic reality. While some economists acknowledge that the public nature of water precludes

true markets, they often then advocate 'transferable allocation permits' as the best method for allocating water to particular uses without explaining how such tradable permits would differ from markets (Rosengrant & Binswanger 1994).

The first step in attempting to marketise raw water is to create definite property rights (Dinar 2000; Teerink & Nakashima 1993; Rose 2005). Concepts of property in water can be broadly divided into three types: common property, private property, and public property, which correspond closely to the three real world models of water law found today in the United States (see Chapter 12, Dellapenna, this book). Because of transaction costs, markets failed to emerge in the United States even under appropriate rights—the private property model for water rights (Dellapenna 2000). The few examples that market advocates claim demonstrate that markets could succeed as major tools for water management—as methods to accomplish significant changes in how water is used—upon close examination prove to be counter-examples. The same is true for the highly touted 'water markets' in Chile.

22.3.2.1 The California Water Bank and the Imperial Valley 'Sale'

Market advocates point to two examples of supposedly successful water marketing in California as proof that markets for raw water work (Gray 2005: 54; Jercich 1997; Lee 1999: 71–72; Ruml 2005: 194). These examples, the 'California water bank' and the 'sale' of water to San Diego by the Imperial Valley Irrigation District, upon close examination turn out not to be markets.

22.3.2.2 The California Water Bank

California created its Water Bank in response to a 5-year drought in the late 1980s and early 1990s (Gray 1994; Jercich 1997; O'Brien & Gunning 1994). The water bank moved water out of agriculture to serve the more numerous voters in certain northern California cities. California dispensed with the normal constraints that impeded the successful operation of markets—primarily, the need to concern itself with the effects of its transactions on third parties holding valid water rights. This gave the state, as buyer or seller, an inestimable advantage over private buyers or sellers. The water bank was a small operation by California standards, involving at its peak 400,000 acre-feet (500,000,000 m^3) when the state's shortfall exceeded 6 million acre-feet (7,500,000,000 m^3). It was the only legal buyer for the 350 sellers of water rights and the only legal seller for the 20 municipalities allowed to buy water rights. The water bank's prices were set administratively and not from bidding in a market and the water bank also selected the buyers and sellers by administrative fiat, selling 70% of the water it made available to just three urban water providers. The California Water Bank simply was not a market in any meaningful sense; rather it was government administration of water policy using economic incentives and a thinly veiled hint of coercive power.

22.3.2.3 The Imperial Valley Water 'Sale'

Nearly a decade later, a 5-year drought covering the entire southwest of the United States provoked a transfer of Colorado River water from several large irrigation districts in southern California to large cities in the state. These too were not market transactions. In one, the city of San Diego asked the Imperial Valley Irrigation District to sell 800,000 acre-feet (1MCM) of water—about 11% of its allocation from the Colorado River, but the District board voted 3–2 in December 2002 to reject the offer (Gardner 2002; Murphy 2002). The federal and state governments then pressured the District to sell; Secretary of the Interior Gail Norton cut the District's allocation of water from the federal works on the Colorado River by 9%, offering to restore it only if it was sold under the terms of the rejected contract (Jimenez 2003). The Irrigation District, after suing Secretary Norton unsuccessfully (Gardner 2003a), surrendered and 'accepted' the contract by another 3–2 vote (Gardner 2003c).

The 'sale' by the Irrigation District was hardly a market transaction given the heavy government involvement in selecting the buyer and the seller, in setting the terms of the transaction, and in coercing 'agreement'. San Diego did pay cash to the owners of the farms served by the district, but gave only unemployment to the farm workers on the land idled in order to free up water for San Diego (Ralph 2003) and threatened disaster to ecosystems dependant on runoff from the farms (Delfino 2006). Even the landowners felt short-changed (Cline 2003). In contrast with the intense struggle involving the Imperial Irrigation District, the nearby Coachella Valley Irrigation District quietly agreed to sell part of its water. This is hardly a better example of a market; with the Imperial Valley Irrigation District's experience happening right in front of them, the vote of the Coachella District board hardly seems, in any real sense, voluntary (Gardner 2003b).

22.3.2.4 California Conclusions

The foregoing examples did not involve anything like a true market. Rather than successful markets, they were state administration masquerading as a market (Gray 1994: 296–308). The state used economic incentives to encourage private and public actors to comply with the state's policy choices while disregarding the effects of the state's actions on other private or public actors whose claims, if recognized, would have precluded accomplishment of the state's goals. Such economic incentives depend on the premise that economists or bureaucrats will do a better job of setting the price than the market. Economists and bureaucrats almost certainly will get the price wrong—as long as the 'right price' is defined as any other than the price economists set (Oates 1996). Moreover, the social consequences of these transactions were regressive. While the transactions introduced flexibility to water uses, they transferred wealth from those who formerly used water—particularly the sellers' neighbours who lost their water rights without compensation—to those who thereafter would use water (Gray 1994: 252–271; O'Brien & Gunning 1994:

1078–1083). The California Water Bank transferred wealth from relatively poorer farmers to relatively wealthier middle class urban dwellers (Gray 1994: 252–271; O'Brien & Gunning 1994: 1078–1083). Much the same happened in the Imperial Valley 'sale', even for the farmers who were paid (Cline 2003). For farm workers losing their jobs and ecosystems deprived of water, we again see a transfer of wealth from the poor to those who are better off (Robbins 2003). Flexibility, even at the cost of dispossessing those who are already disadvantaged in society, might be a laudable goal in California in the late twentieth century, yet considerable evidence suggests that for water, if not for other resources, equity is more important to society than efficiency (Brajer & Martin 1989; Howe 1996; Naegele 2004).

22.3.3 The Chilean Experiment

In 1981, the Pinochet regime in Chile enacted a water law consistent with its neo-liberal economic programme (Peña 2005). The law granted water rights to potential users according to their likely profits from using the water, but without requiring that they actually use the water. The law also authorized the sale of water rights without regard to third-party effects. Economists around the world praised the law as a model of market management to be emulated in other countries (Rosengrant & Gazmuri 1994; Thobani 1997). And during the period 1985–1995, considerable growth occurred in economic activity related to water (Donoso & Melo 2004). This was not because of water markets, however; there was in fact very little market activity, either because holders of water rights preferred to hoard their rights and block entry by potential competitors or because of organized opposition in certain river valleys to the operation of markets (Bauer 2004; Bauer 2005). Carl Bauer documented how market advocates sang the Chilean law's praises without examining how it actually worked. And, as in California, what little actual impact the Chilean law had resulted in a transfer of wealth from the poor to the better off, with negative effects on the environment (Bauer 1998). Finally in 2005, the Chilean government enacted reforms to water rights, imposing forfeiture if not put to use within a set time and limiting grants of future water rights to needs for actual uses (Peña 2005). The reforms also authorized the reservation of water resources to meet public needs. The Chilean experiment thus is hardly a shining example of the utility of markets.

22.4 Conclusions

The attempt to commodify water thus far has generated the inequities that follow from markets without bestowing the benefits that markets at their best can provide—the rational management and efficient use. The utter unsuitability of markets for managing raw water—water in bulk in its natural sources—suggests that blind faith better explains the insistence on markets than the rational application of

well-founded economic theory. There is a deeper problem with market advocacy than just that water is a special resource, for which markets—true markets, with willing buyers and willing sellers, acting without the state's direction and control—do not work. The supposition that economic theory accurately represents how people think, and therefore enables accurate prediction of how they will behave, has failed in numerous experiments. These problems have been recognized for many years, long enough to have spawned a countermovement of cognitive psychologists and certain economists who style their studies as 'behavioural economics' or 'socioeconomics' (Korobkin & Ulen 2000; Symposium 2003, 2006). Their studies show that irrationality is built into how people make decisions, irrationality that prevents the market models from working as economists assume.

An economist's notion of irrationality often is just another person's idea of taking into account different values—values that are impossible to price and therefore impossible to appraise or manage through a market. No one denies that economics is relevant, but it is not the only relevant mode of analysis. The problem with market advocates—including those who dominate the Washington consensus—is their refusal to recognize that markets are not always the best technique for managing a particular resource or for solving a particular problem. Rather than viewing the resistance to markets for water as a failure of policy makers to force through necessary market reforms, reformers of water law need to consider alternatives to markets—including economic incentives—as means for adaptive management of water resources. It is time not to eliminate markets under all circumstances as a possible choice (remember bottled water), but to recognize them as an option, an option that is not very good for raw water (Davis & Whittington 2004; Molle 2004; Naegele 2004).

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Part V
Conclusions

Chapter 23
The Challenges for the Twenty-First Century: A Critical Approach

Joyeeta Gupta and Joseph W. Dellapenna

Abstract With a history of about 5,000 years, water law and water governance have only just arrived on the global agenda. During these centuries, there have been incremental developments in governance processes from the local to the global level. Unlike other fields of resource governance, water is a field with a rich density of governance efforts, closely linked to the evolution of religion, culture, history, geography, and economy in different parts of the world, often expressed in legal terms. Against this background, this chapter sums up the key historic trends that have influenced water law through history, identifies major present day characteristics and goes on to review challenges for the twenty-first century.

Keywords Codification • customary water law • water and religion • legal pluralism • globalisation

23.1 Introduction

The history of water law runs parallel to the history of civilizations. Water has been the subject of folklore, it has been personified as gods (e.g., Indra and Varuna in Vedic societies; Osiris in the Nile Valley; Enki or Ea in Mesopotamia; and Poseidon, Triton, and Pontus in Greek mythology), it has been made the subject of religious doctrine (e.g., in the Hindu, Islamic, Jewish, and Christian traditions), and

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it is now the object of economic ideology. Practices and customs relating to water have developed over centuries and the density of social norms and rules, as well as legal regulations, in water management is extremely high.

Since water governance is not normally taught in universities, most entering the field feel that it is a new and young subject. This is a naïve mistake for working in the field of water governance only serves to show how complex a field it is and how social practices are so entrenched that it is not easy to re-shape water policies and rights. This brings up the eternal challenge: How does one find one's way through this maze of dense rules to understand global water governance and to craft rules with respect to water that are likely to have a high compliance pull in each locality? Global water governance refers to governance from the local through to global levels.

This book aimed at addressing the following questions (Chapter 1, Dellapenna and Gupta, this book): How has water law and policy evolved through the centuries? What were the motivating factors that led to change in legal and social practices? Why is it that after 5,000 years of governing water resources, we still appear not much closer to understanding and addressing water resource issues? What can we learn from the history of water law and policy? To answer these questions, this chapter draws on the history explored in the chapters of this book to provide a brief global history of the cultural and religious matrix within which water governance has functioned and the national and regional water governance patterns that emerged from this milieu (see §23.2). Besides building on previous chapters, this chapter fills in the gaps through a literature review. This chapter then provides a state of the art assessment of water governance at the opening of the twenty-first century (see §23.3). Finally, it draws some conclusions about the challenges facing water law in the twenty-first century (see §23.4). This chapter provides a comprehensive, highly dense analysis of evolutionary processes worldwide.

23.2 The Evolution of Water Law and Policy

Over about 5 millennia differing systems of water law have emerged and evolved across the world. These have reflected differences in water supply and local hydropolitics, while other forces have led to a certain convergence among systems of water law. These different patterns are briefly summarised in this section.

23.2.1 Diverging Water Law Traditions Worldwide

Early hunter-gatherer societies worshipped the land, the water, and the forests. As they settled down to agriculture, they began to worship the sun, rain, and other natural forces. As they became more developed they turned to more abstract religions. With the rise of neoliberal thinking at the end of the twentieth century, many in numerous societies increasingly came to see water as an economic

commodity. This might suggest that history progresses in a linear way, but the reality is much more complex.

In different parts of the world, different water histories emerged. In early Mesopotamia (Chapter 2, Kornfeld, this book), the need to cooperate in an arid region in order to promote agriculture and development led to a system of customary rules of water management focusing on water as a communal good, the maintenance of water bodies, liability for damages, rules to prohibit diversion of waters at the cost of downstream owners, and peaceful resolution of disputes. These customary rules were subsequently embodied in legal codes, such as that of Hammurabi. The Islamic water law tradition (Chapter 3, Naff, this book) also developed in arid regions. Under Islam, water is seen as an indivisible, non-marketable gift of God for which humans are custodians who must share equitably according to principles of priority of use. Water rights were strictly limited and based upon the investment of money or labour in developing water for human use. Hindu water law also reflects institutionalised social customs. Water was seen as indivisible, to be used for the benefit of society, with a system of punishments for improper diversion, obstruction, and pollution of water. Later Indian societies developed systems of taxes and limited private ownership subject to maintenance of the water body (Chapter 10, Cullet & Gupta, this book).

National water law histories show how differently Brazilian water law (Chapter 5, Farias, this book) developed from Kenyan (Chapter 7, Nilsson & Nyanchage, this book), South African (Chapter 6, Kidd, this book), Indian (Chapter 10, Cullet & Gupta, this book), American (Chapter 12, Dellapenna; Chapter 13, Zellmer, this book), and Australian (Chapter 11, McKay & Marsden, this book) systems. While riparian systems may have worked in the UK, experiences in South and East Africa, Israel, and Australia show how inappropriate it was for arid regions. Four factors have influenced contextual variation in water law (see Table 23.1).

Table 23.1 Differential factors leading to different water laws

Factors	Description
Water geography	Civilizations (e.g., Egyptian, Mesopotamian, Indus) developed along river basins (e.g., Nile, Tigris & Mesopotamia, Indus). Arid regions developed water rules first and those rules shaped local culture (Islamic water law; Jewish water law); scarcity is the mother of invention
Economic dependence	Food gatherers did not need water rules. Agricultural societies were and are very water dependent and therefore need rules, so early civilizations developed water rules (e.g., the Indus Valley, Mesopotamia). Industrial and service oriented societies need less water
History and hydro-politics	Movements of people and conquests led to new water systems (e.g., Australia, Brazil, India, Kenya, South Africa); evolving hydropolitics shaped water law
Importance to ecosystems	Ecosystems compete with humans for water; while ignored in the past, societies give increasing importance to it (e.g., new laws in Australia, South Africa, and the United States)

23.2.2 Forces Leading to Convergence in Water Law

Building on earlier work (Gupta 2004; Gupta & Leenderste 2004; Dellapenna & Gupta 2008) and on the theory of how epistemic communities lead to converging state policy (Haas 1989), this section submits that despite contextual differences in water law, there have been eight forces through history that have promoted convergence in water law (see Table 23.2). First, early civilizations (about 5000 to 100 BCE) spread initial rules on water management throughout the reach of the civilizations. Examples include the Mesopotamian (Chapter 2, Kornfeld, this book) and the Indus Valley pre-Vedic societies (Chapter 10, Cullet & Gupta, this

Table 23.2 Forces leading to converging domestic water law and policy

Forces: The spread of	Example	Implication
Civilizations	Mesopotamia, Indus	Rules on ownership; water diversion; water pollution
Religion	Islamic, Jewish, Hindu	Religious character of water; punishments for misuse; priority of use principles
Conquests	Roman, Islamic, Colonialism	Roman ownership laws spread through the European continent and then to French, Italian, Belgian, Dutch, Spanish and Portuguese colonies; later codified under Napoleon. English riparian doctrine spread to English colonies. Islamic conquests carried *shari'a* to new regions
Communism	Soviet Union, satellite European states, Cuba, China, Angola, Mozambique	Water is owned by state; major restrictions on private ownership
International codification: Precedent, state practice, treaties	International Law Association (1966, 2004); 1997 UN Watercourses Convention; 1992 Helsinki Watercourses Convention; International Law Commission (2000)	Articulation of different principles of sovereignty; equity principles in sharing water; the no-harm principle; institutional development (the need for joint commissions, etc.) and options for peaceful resolution of disputes; the emerging idea of a human right to water
Environmentalism	Environmental laws and policies; Environmental NGOs	Articulation of environment impact assessments; environmental quality and emission standards for water bodies
Epistemic communities	International Water Association, International Water History Association, Global Water Partnership etc.	Dams as the solution to water shortage; articulation of integrated water resources management; water as an economic good
Globalisation	A common trade and investment framework; harmonisation of aid; global political meetings	Private sector participation in water; trade and investment rules affecting water

book). They developed along riverbanks, experienced a shift from hunter-gatherer communities to sedentary, agricultural communities and therefore needed reliable water rules to guarantee proper use. As they traded their agricultural surplus on water routes, this also needed greater regulation.

Second, as societies settled and evolved, religious development followed (500 BCE to 800 CE). Most early religions (Judaism, Islam, Hinduism) developed rules of water management and although these rules reflected local customs, they had an additional source of legitimacy (divine regulation). As these religions spread to different parts of the world either through conquest and enforced conversion or through adoption by personal conviction, the concepts spread (Chapter 4, Laster et al.; Chapter 3, Naff; Chapter 10, Cullet & Gupta, this book).

Third, conquests and colonization (100 to 1950 CE) spread the water law rules of the imperial country to different corners of the world. The military conquests in the wake of industrialisation were motivated by mercantilist/capitalist ideology. Foreign rulers brought their laws with them to the countries they occupied. Clear cases where foreign rulers have directly applied their own national laws and rules in the foreign country include the many English colonies that adopted riparianism—e.g., South Africa (Chapter 6, Kidd, this book); Australia (Chapter 11, McKay & Marsden, this book); and the United States (Chapter 12, Dellapenna, this book). Sometimes the foreign ruler decided to take control of the water but nonetheless largely left local customary systems of administration in place—e.g., India (Chapter 10, Cullet & Gupta, this book), Israel (Chapter 8, Laster & Livney, this book) and Kenya (Chapter 7, Nilsson & Nyanchage, this book).

Fourth, after 1917 CE, Communist ideas spread to the second world, including the former Soviet Union and its satellite states in Asia (e.g., China, Vietnam), in East Europe (e.g., Poland), and in Latin America (e.g., Cuba). With Communism, water became subject to state control and was generally nationalised. While Communist approaches to water law have now largely disappeared (Chapter 9, Kotov, this book), the concept of water as public property subject to state management continues to be important today.

Fifth, legal codification (from 1750 down to today) has had a key influence. Although codification is not new (e.g., the Code of Hammurabi; Ashoka's edicts; etc.), the codification of national legal systems in the nineteenth and twentieth centuries made water law more systematic and often more effective. In 1966, the International Law Association (ILA) prepared the first modern code of international water law. These *Helsinki Rules on the Uses of International Rivers* (ILA 1966) are cited as an influential reference work by many countries. The UN Watercourses Convention, approved by the General Assembly in 1997, also serves as a code and is highly influential, having inspired several treaties. The ILA *Berlin Rules on Water Resources* (ILA 2004) too may become influential over time (see Chapter 1, Dellapenna & Gupta, this book).

Sixth, the rise of epistemic and engineering communities (e.g., the International Water Resource Association, the International Water History Association, UNESCO-IHP, the World Water Assessment Programme, etc.) and their journals (e.g., Water Policy; Water Management; Water International; Journal of Water Law), confer-

ences, and publications have created a new literature on water, promoting, *inter alia*, the concept of integrated water resource management (IWRM). The resulting epistemic community is extremely influential in managerial circles (Conca 2005).

Seventh, with the rise of environmentalism, two types of consciousness have emerged. (a) The issue of environmental and water pollution and their impact on ecosystems has become urgent leading, *inter alia*, to the development of environmental impact assessments of water projects; and (b) the concept of sustainable development.

Eighth, with the rise of globalisation (Friedman 2005) and the domination of neo-liberalism (especially given the end of Communism in Russia and its former satellite states, in China and Vietnam [in fact, if not in name], and possibly in Cuba), globalisation is marketing neo-liberal capitalism and the idea that the private sector should be actively engaged in water governance. The initial results have not always been favourable because water services tend to be a natural monopoly and the private sector has no reason to be altruistic in providing water for the poorest. There are already rumours that Italy and Sweden have withdrawn their support for such private sector participation. Growing resistance in many communities has resulted in legal and practical barriers to privatisation of water services and even the recapture of privatised services by governmental authorities (Chapter 22, Dellapenna, this book). There is also a new legal undercurrent and that is the notion of the human right to water for which a small constituency is slowly growing.

This section has argued that although there are four composite differential factors (water geography, economic dependence on water, history and hydropolitics, and the importance given to ecosystems) that lead to different water laws in different parts of the world, there are eight forces that have led to converging trends in water law worldwide.

23.3 Current Global Trends

Water law has evolved slowly over time. That evolution has accelerated over the last century, without other water-centred professions paying much attention to the resulting changes. This section provides an overview of current global trends in water law. It looks at the trends at national, supranational and global level.

23.3.1 Trends at National Level

Significant and fairly consistent patterns in national water law can be summarized as: there is pluralism in the South, coherence in the North even though the degree of detail, resources, and implementation differ in each nation; and global trends introduce or preserve disharmony in an apparently stable system of converging policies. These apparent contradictions are hardly surprising given that change has been and continues to be constant in water law and policy. We have, in short,

not reached the end of history. These points deserve a brief explanation and are discussed below.

23.3.1.1 Pluralism in the South; Coherence in the North

The long and convoluted history of water law has meant that although in many developed countries there is a coherent system (e.g., The Netherlands), even if federally diverse (e.g., USA or Australia), most developing countries have pluralistic or fragmented water law systems (Chapter 7, Nilsson & Nyanchage; Chapter 10, Cullet & Gupta, this book) in which multiple legal traditions function simultaneously. The spread of water law rules through the eight converging forces delineated above did not automatically lead to *deep* convergence. While systems changed on paper, often they did not change in practice, either because of principles of dharma (Chapter 10, Cullet & Gupta, this book), different contextual circumstances, the desire to avoid rebellion or cope with rebellion (e.g., in colonial Brazil or Kenya), and possibly because the conqueror had no incentive to compel obedience to the new rules. With the industrial revolution, colonial conquerors took a more predatory approach to water in their colonies, often disregarding community and indigenous ownership (e.g., USA, Australia, Canada, or India). Examples of overlapping systems in India (Singh 1991), Africa (Ramazzotti 1996), and Kenya (Chapter 7, Nilsson & Nyanchage, this book), however, continue to exist. Thus, in many parts of the developing world, there exist overlapping systems of law (see Fig. 23.1). Table 23.3 shows

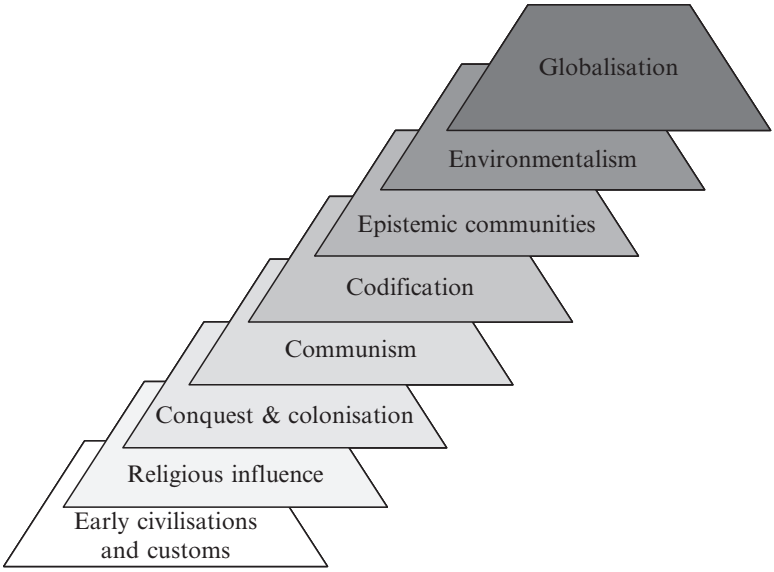

Fig. 23.1 The overlapping influences through history

Table 23.3 The influence of colonization and custom in African countries

	Precolonial system(s)			Colonial influences								
	African traditional	Islamic influence	Islamic derivation	BE	DE	F	IT	PG	SP	TK	UK	SA
Ghana, Kenya, Nigeria												
South Africa, Uganda											X	
Zambia, Zimbabwe												
Benin, Burkina Faso Ivory Coast	X					X						
Rwanda, Burundi	X			X							X	
Tanzania	X				X						X	
Angola, Botswana	X							X			X	
Cameroon	X				X	X			X		X	
Namibia	X				X			X			X	X
Togo	X				X	X						
Zaire	X			X				X				
Gambia		X				X					X	
Libya		X					X			X		
Egypt			X								X	
Tunisia			X			X						
Tanzania (Zanzibar)			X		X			X			X	
Malawi, Sierra Leone Sudan	X	X									X	
Madagascar, Mali Senegal	X	X				X						
Chad	X	X			X	X					X	
Niger	X	X				X					X	
Congo	X	X		X		X						
Somalia	X	X				X	X				X	
Ethiopia, Eritrea	X	X	X				X				X	
Mauritania	X	X	X			X						

Source: Based on data from Ramazzotti (1996); BE—Belgium; DE—Denmark; F—France; IT—Italy; PG—Portugal; SP—Spain; TK—Turkey; UK—United Kingdom; SA—South Africa.

that as many as 22 different legal systems operate in African countries, with several operating in most of those countries.

Despite these differences between North and South, water law and policy worldwide today cover similar issues. These include rules regarding water rights and ownership; sovereignty and equity; the no harm principle; integration of environmental issues in water management; integrated water resources management; strong roots in modern science; similar discussions with respect to the need for enhancing democracy through public participation, decentralization and management at the lowest possible level (subsidiarity); and discussions with respect to the role of the private sector (see Tables 23.4 and 23.5). Although similar, the differences tend to be in the degree of detail of regulation, the degree of resources allocated to the issue, and the depth of implementation of these provisions.

Table 23.4 Key water law principles

Principles		Types	Sources
Water law	Sovereignty	Claims of untrammelled sovereignty give way to recognition that states sharing water resources form a community that must collaborate or cooperate in managing the resource	Innumerable treaties
	Equity	General principle	Implicit in virtually all water agreements; explicit in 36% of agreements (1980–2000)[a]
		Specific criteria	ILA 1966; UN Watercourse Convention 1997; explicitly addressed in 26% of agreements (1980–2000)[a]
	Avoidance of harm	The 'no-harm' principle	27% of agreements (1980–2000)[a] recognize the duty to use due diligence to avoid unreasonable harm to another state
Human Rights	Participation	Of riparian states	UN Watercourses Convention 1997
		Of communities	EU 2000 WFD; UNECE 1992 Watercourses Convention; Aarhus Convention
	Conflict resolution	Negotiation, Fact Finding Commission, Arbitration, International Court of Justice	ILA 1966; UN watercourses Convention 1997; addressed explicitly in 55–63% of agreements (1980–2000)[a]
	Prior informed consent	From other nations about planned measures	UN Watercourses Convention 1997; some bilateral treaties
	Human rights	To water	MDG 2000; General Comment 15
		To sanitation	Johannesburg Declaration 2002
Environmental law	Environmental Impact Assessments	To test projects & programmes on environmental impacts	Rio Declaration 1992; Espoo Convention; UNECE Convention
	Sustainable development	To promote social, economic and ecological goals for current and future generations	Rio Declaration 1992 and many treaties
	Precautionary approach	To avoid irreversible damage even when science is uncertain	Rio Declaration 1992 and many treaties
	Polluter pays principle	Internationalisation of environmental costs	Rio Declaration 1992 UNECE 1992 Watercourses Convention
	Decentralisation	Subsidiarity; delegation to lowest appropriate governance level	Rio Declaration 1992 EU 2000 Water Framework Directive
	Open international economic system	Promotion of freer trade	World Trade Organisation; numerous regional free trade agreements
	Notification	Of accidents	Rio Declaration 1992; UN Watercourses Convention 1997

Table 23.5 Water principles from other sources of governance

Existing legal principle	New principle	Elaboration	Sources
Water rights based on ownership, appropriation, and licensing	Water as an economic good	The pricing of water and private sector participation	Structural adjustment (IMF), Dublin Principles 1992; World Water Forum; Aid agencies; trade liberalization in GATT
Sectoral approach to water; different laws relevant to water in different fields	Integrated Water Resource Management (IWRM)	A need to: set policies, the legislative framework, and incentives; create organization & capacity; adopt water resource assessments, plans for IWRM, demand management, social change instruments, conflict resolution, regulatory, economic and Information management instruments	Dublin Principles 1992; Agenda 21 1992; World Water Forum; Global Water Project 2004
Gender bias concerns: ownership & appropriation often only possible by males	Mainstreaming gender issues	Take women into account	Dublin Principles 1992
Contextual governance	Good governance	Public participation, transparency, equity, efficiency, rule of law, accountability, coherence, responsiveness, integration into account	World Bank; and aid agencies. UN World Water Development Report 2006
State regulation of contracts	International trade and investment law and arbitration	High level of protection to foreign investors	Investment treaties, World Trade Organization, and regional free trade agreements

23.3.1.2 Disharmony and On-Going Change

In addition to the foregoing patterns, two additional sources of disharmony have been introduced into contemporary policy processes. The first is the disharmony that results in decentralizing policy, leading to different policy conclusions within a single state or water basin. For example, do laws that aim at harmonising policies in different parts of the same river basin, and at the same time use catchment councils to develop contextually relevant policies, have irreconcilable goals because real community participation at the local level could lead to different policies and practices in different regions? The second is the disharmony that results from diverging pressures created by diverging actors. For example, Indonesian water law is extremely ambiguous about water privatisation and public sector participation, putting both concepts into one article. That law aims both to democratise policy processes and to allow for private commercial exploitation. Similarly, in the Philippines, the pressure to compensate indigenous people for the problems they have faced in the past has led to a new law that privileges indigenous people much more in comparison to the non-indigenous poor by guaranteeing the right of the former to access to water, but not that of the latter (Tenoria-Labang 2007).

The evolution of water law reveals that there is nothing constant in this area. As one delves into the pages of history, what becomes apparent is that ownership rules on water have gone back and forth. Through history, water ownership has been a critical legal issue. Water has been in community hands (in customary and religious legal systems) and then moved to private ownership (where human labour resulted in access to water—e.g., constructing a well in Islamic law), to state ownership (following conquests by foreigners or through the rise of Communism), and back to community systems (with the advent of the decentralization mantra), to private ownership (via the neo-liberal ideology), and to state control and the public trust given the growing political significance of water and the need to recognize that ecosystems need water (e.g., South Africa, Australia, European Union).

Along with the changing notions of ownership, there have been changing notions of the virtues of centralisation versus decentralisation. Early societies had decentralised water management systems. As agricultural systems developed in arid or semi-arid regions and economic surplus was created leading to trade, the need for water storage systems and centralised management of water became more important. This led, on the one hand, to the aqueducts of ancient Rome and the canals of Mohenjodaro and, on the other hand, to the development of social norms and rules as to who could access water, and how responsibilities would be allocated. For example, in some systems, notably the Islamic and Hindu systems, there were rules against the hoarding of water, about maintaining water harvesting systems, and for compensating those negatively affected. In the Islamic and traditional Kenyan systems, water access was encouraged and those who put in labour to build wells and water harvesting systems were rewarded with limited ownership rights. In the Hindu system, lack of maintenance of tanks and wells eventually even resulted in a suspension of ownership rights. And then, either because rulers wanted to consolidate control or because aridity made it imperative, water resources were nationalised and managed from the centre. When this proved difficult, they would

decentralise services such as water supply and sanitation. In order to deal with the cumulative water problems of the late twentieth century, a number of countries have once more centralised water ownership in the state. Yet a shortage of financial resources combined with the lack of legitimate power and under the influence of globalisation and epistemic communities, many countries are once more decentralising water management (e.g., Indonesia) or inviting private sector participation and public sector participation as well.

23.3.2 Trends at Supranational Level

The strong supranational tendencies within Europe deserve a few words (Kissling-Näf & Kuks 2004; Chapter 14, Canelas de Castro, this book). Key features of the supranational water law approach are: (a) the harmonization of goals, policy approaches and instruments in an already complex highly regulated area of water law; (b) a focus on basing decisions on science; (c) a constant struggle within the European Union between centralizing policies to ensure harmonization and minimize damage to others and subsidiarity and context relevant policies; and (d) a recent privatisation trend, with a resulting struggle between that trend and the vision of water as a 'common heritage'.

While the regional level is less well developed in other parts of the world compared to Europe, it is beginning to emerge in many different areas (Chapter 15, Van der Zaag; Chapter 16, Sabel; Chapter 18, Capaldo, this book). The century of cooperation over water between Canada and the United States is often referenced as a model that other nations could follow (Chapter 17, Hall, this book). The International Law Association has also provided something of a template that nations could use to design their own regional water management regime (ILA 2004: arts. 64–67).

23.3.3 Trends at Global Level

At global level, a number of principles have emerged as critical. The key variables include the emergence and harmonisation of sometimes disparate theories of international water law, the competition of other sources of global (or transnational) water governance, conflict between the impulse to universalise governance norms and the felt need to tailor norms to particular needs, and the rise of related areas of law that operate on at least somewhat different premises. Each point will be briefly addressed in this section.

23.3.3.1 The Elaboration of the Principles of International Water Law

Over the past 150 years, an elaborate body of international water law has emerged that provides workable guidance to nations in managing internationally shared water resources (ILA 1966, 2004; UN Watercourses Convention 1997; Dellapenna 2001).

This body of law includes a set of principles that have been widely recognized and implemented. These principles, which include the elaboration of the equity principle, the no-harm principle, dispute prevention via participation of key actors in the policy making process, and the peaceful resolution of disputes through the elaboration of dispute resolution measures, do not, by themselves, resolve disputes over internationally shared waters. That takes political will to translate these principles into concrete arrangements on the ground and to create the necessary bodies to enable and carry out on-going cooperation regarding those waters (Dellapenna 2006, §§49.05(b)(3), 49.05(c)). Some would go so far as to declare that the principles are too vague to be of any actual use (Upadhye 2000). Yet these principles do establish a baseline that precludes certain claims by nations, while the principles could and do serve to guide negotiations to resolve disputes and create cooperative relations regarding internationally shared waters (Dellapenna 1996). Table 23.4 lists the principles, their attributes, and their key sources.

23.3.3.2 Competition from Other Models of Governance

Public international law in the area of water increasingly faces competition from other sources of governance including commercial international law. As Chapter 1 (Dellapenna & Gupta) emphasised, non-UN governance forums are marketing a number of ideas globally via conferences, commissions and conditional aid. Pre-eminent ideas are those on integrated water resources management, water as an economic good, and the need for participatory water management. UN forums sometimes appear to be competing with the legal regime and sometimes to supplement or complement it. Many of these 'non-legal' approaches have set themselves up in competition with the legal approach, unlike in many other fields of governance (e.g., climate change). They have ranged from a broad ranging focus on 'integrated water resources management' to specific issues such as the role of gender in perpetuating water mismanagement (Marino & Simonovic 2001; Zwarteveen 2008). Table 23.5 summarizes these competing models.

23.3.3.3 Universalisation Versus Tailor-Made Solutions

While the harmonizing trends tend to promote common approaches (e.g., water as an economic good; good governance, etc.), these may conflict with local cultural approaches. Strong social values determine people's feelings towards water and these values need to be taken into account in developing policies. In most Islamic schools of law (except the Maliki school), water cannot be bought and sold. The pricing of water and the approach to rationalising and commodifying water is considered a sacrilege. In many civilizations, water is vested with sacred properties and the thought of harnessing the power of water for large-scale electricity production and irrigation facilities may be unacceptable, especially as such processes are more often than not accompanied by changing power structures and hence changing rules on

access and ownership. Similarly there may be conflict with indigenous law. As Solón (2006: 38) puts it: 'In summary, imposing laws, conditions on loans, and the inclusion of water in free trade treaties, not only endangers democratic management of this fundamental resource, but eliminates cultural diversity by imposing one model over the others. It standardizes water management, putting an end to centuries of social commnity water management, of which the indigenous peoples are living exponents.'

Where literacy levels are low, stakeholder participation that is not tailored to deal with these specific situations may fail (Ankersmit 1998). Where women and youth are usually not allowed to have a say in setting policy, stakeholder approaches may either be ineffective or compromise the safety of these people in other contexts (Cleaver 2000). Different stakeholders do not operate on a level playing field and those with more power may dominate in such sessions (Upadhyay 2000; Wester & Warner 2002). Implementing environmental impact assessments in poor countries has been very difficult because of problems in their legislative, organizational, procedural and administrative frameworks (Ebisemiju 1993; Bojórquez-Tapia & García 1998; Alshuwaikhat 2005). The assumption that there is linearity in history, that one phase necessarily follows another, is not true. Furthermore, universalisation presents a modern challenge to international law. Where law was based on state practice and international law merely harmonised existing systems, one could expect a high compliance pull. However, where international law is in advance of state practice, where it is based on some new scientific ideas and where the local context is ignored, the likelihood of compliance is at risk, especially in relation to developing countries (Gupta 2006).

23.3.3.4 The Rise of Complementary yet Differing Rules of International Law

While legal evolution would suggest that water law principles would spill over to other fields of law, this is not necessarily the case. Water law principles, especially those of equity and no-harm do not appear to have found their way into other environmental regimes in quite the same way. For example, in the area of climate change, the no-harm principle was relegated to a reference to the limited sovereignty principle in the preamble of the Climate Change Convention, and equity is seen in terms of common but differentiated responsibilities of rich and poor countries. The greater influence of ideas within the climate change regime on global policy is evident in the Rio Declaration of 1992, which did not adopt the equity principles from the water regime, but instead took over the equity principles from the climate change regime. The fact that the 1997 UN Watercourses Convention has not entered into force may be testimony to the unwillingness of governments to accept these equity principles in a global treaty, although there could be other reasons for that failure (Salman 2007). In other words, possibly new global trends in accepting legal principles may shape the future of water law principles more in favour of neo-liberal market approaches than equity approaches. The current discussions on the adoption of a human right to water and sanitation within the Human Rights Council, however, offers some balance.

23.3.4 Inferences

This section has argued that at national level three trends are visible (pluralism in the South, coherence in the North; similarity of legal approaches, yet continuing disharmony in policies; and constant policy change to cope with emerging and continuing challenges). At supranational level, four trends are visible (harmonization of policy; science based policy; struggle between centralisation and subsidiarity; struggle between common heritage of water and private sector participation). At the global level, four trends are also visible (emergence of common institutions; the conflict between harmonisation and tailor made approaches; conflict with other sources of governance; and threats to water law principles from other legal principles). These changes suggest that the field of water law at all levels is more complex than is commonly thought and poses significant and on-going challenges to those seeking to improve water governance across the globe.

23.4 Addressing the Challenges for the Twenty-First Century

A large number of challenges face humans in the twenty-first century, many of which centre on water. Water is closely associated with health, food and agriculture, industry and energy, and ecosystems. Furthermore, the availability and reliability of water resources will be dramatically altered by the emerging global climate disruption (IPCC 2007). Identifying and resolving these challenges is as much a problem for water lawyers as it is for hydrologists, engineers, and economists. This section provides a brief overview of the challenges and possible solutions.

23.4.1 The Water Challenges

With one-sixth of the global population without access to potable water and one-third without access to sanitation, it is no wonder that 5,000 children die daily from water related diseases, making water related disease the second largest killer of children after tuberculosis. Access to water and sanitation is a critical first step to break the poverty cycle. Reaching the Millennium Development Goals targets on water would require increasing services to 300,000 people per day and sanitation to 450,000 per day until 2015 (UNDP 2006); this would require a quantum leap in current efforts, and yet would be insufficient to meet any new human right to water and sanitation.

The demand for water for other economic needs is also growing, with agriculture continuing to use 80% of global water. In the rich countries, both direct and indirect water consumption is increasing rapidly. While individuals use between 200–400 l of water daily, increasingly bottled water (with a large environmental footprint) is being brought in from other countries. Water in agricultural products (e.g., coffee,

potatoes, rice, meat, etc.) and non-agricultural products (e.g., cars, clothing, computers, etc.) increases the virtual water consumption of the rich by many times (Allan 1998; Hoekstra & Chapagain 2007; Sealing 2007; Warner 2007). This leads to increasing depletion of water resources on the one hand and increasing pollution on the other. Pollutants include organic matter (depletion of oxygen causing ecosystem stress), pathogens and microbial contaminants (causing diseases), nutrients (causing eutrophication and oxygen depletion), salinisation (killing crops and reducing the potability of water), acidification (affecting aquatic life and the leaching of heavy metals into soil), heavy metals (toxic accumulations in fish), toxic organic compounds and micro-organic pollutants (causing poisoning and reproductive failure), thermal changes (changing species composition and the decomposition rate of organic matter), and silt (causing turbidity) (UNWWDR 2006: 141).

Added to the existing challenges of water access, water depletion, and water pollution are the new challenges of climate change, which may exacerbate the existing situation with respect to access, flooding, salt water intrusion, etc. (IPCC 2007), especially in tropical countries (UNWWDR 2006: 19). Global law has to be able to cope with these multiple challenges and develop new instruments to cope with these.

23.4.2 The Need for Law to Open Up to Other Disciplines

The water law community in the past has been a highly specialised disciplinary group; in contrast, for example, to the environmental law community that has increasingly attempted to understand the natural and social science issues surrounding environmental challenges. While the International Law Association in its *Berlin Rules* made an effort to open up to other key disciplines, legal scholars in the area of water need to engage more openly with other water scholars. Cross-disciplinary fertilization is necessary to make water governance a more successful area of governance. Non-lawyers have to understand that water law has a very long history that cannot be easily overturned to give way to new ideas; but lawyers may have to understand the scientific and social dimensions of the new environmental challenges in order to jointly search for new tools and mechanisms that can deal with the new issues of the twenty-first century.

23.4.3 The Need for Institutional Change

In 1970, the UN asked the International Law Commission to codify water law, a codification that still has to enter into force. Again in 1997, the UN asked the Commission to progressively develop ground water law. In other areas of governance, however, the UN General Assembly has set up an Inter-governmental Negotiating Committee to negotiate agreements. The latter approach calls for the joint development of a common problem frame and the use of all available knowledge to understand how best to resolve an issue. These multilateral negotiations help to further the

progressive development of international law. While such an approach was used in the climate change negotiations, the lack of International Law Commission work in this field meant that the regime was sometimes developed in ignorance of legal developments. On the other hand, the work of the Commission on water law seemed to progress in ignorance of other legal developments and non-legal developments! In order to enhance the legitimacy of any new water law, the UN General Assembly should both set up an Intergovernmental Negotiating Committee on water issues and request the International Law Commission to provide legal support to such a Committee.

Furthermore, many new environmental negotiations are set up in parallel to address various interrelated yet distinct problems. The Intergovernmental Panel on Climate Change, which shared the Nobel Prize for Peace with Al Gore in 2007, is an example of a body that attempts to assess the available scientific literature on climate change to come up with common policy proposals (IPCC 2007). Similar institutions have been developed for the negotiations on transboundary air pollution and the depletion of the ozone layer (Gupta 2001). Yet there is no common assessment of water issues, and although different bodies prepare different reports, these are in no way comparable. In recognition of the growing importance of water knowledge (both natural science and social science) to making successful water law and policy, such an integrated assessment panel could be one way forward.

23.4.4 Fairness in Water Law

Fairness in water law has grown out of the social realization that civilized societies must meet the needs of the poorest communities and marginalised ecosystems. These fairness principles have been up-scaled in bilateral and multilateral treaties. While most bilateral and regional treaties apply these principles requiring the equitable sharing of water resources, the global community has stopped short of adopting these in global multilateral treaties (Salman 2007). If such new treaties were designed in a different institutional setting, the results might be more readily and universally accepted in the global community. If that were the case, the greatest legacy of water law to other fields of law would undoubtedly be its contribution to fairness and equity in human society.

23.4.5 Inferences

This section has demonstrated that current global problems call for a quantum leap in political commitment, legal organization, and scientific collaboration. It recommends that the UN General Assembly should set up an Intergovernmental Negotiating Committee to deal with global water challenges, supported by the legal work of the International Law Commission. It recommends that an international multi-disciplinary assessment body be created to support this process. Finally, that legal

scholars should focus more concretely on developing instruments in collaboration with other scholars that would empower people and nations through strong support for the principles of human rights, no-harm, equity, prior informed consent, and a liability and compensation regime from the local to global levels. In doing so, a balance needs to be sought between the search for universal norms and recognition that communities may already have a satisfactory way of meeting their own goals.

23.5 A Few Final Words

Why is it that after 5,000 years of governing water resources, we appear to be not much closer to understanding and addressing water resource issues? The answer is probably that first, new problems have developed rapidly following the industrial revolution and traditional systems had no easy answers to those problems. Second, history has shown that apart from traditional community systems, most other systems were those of the conquerors or dictators, and conquerors and dictators seldom had the interest of the common people at heart. Many of these systems survived independence as regimes were taken over by domestic dictators or simply through inertia. Nilsson and Nyangana (Chapter 7, this book) show how post-colonial policy still included a permit application form that allowed water supply at 50 gallons/day for non-Africans and only 10 gallons/day for Africans in Kenya. As modern governments try to reflect the needs of their own pluralist societies, competition between different segments of society often stands in the way of sustainable, equitable, efficient, and democratic water policy.

The history of water law is the history of the struggle to control water and to manage the pollution associated with water. This struggle is manifest in rules of ownership and access, and whether power should be centralised or decentralised. To some of these questions there might well be no final answers, only arrangements that work well for a time and then need to be revised as needs and resources change.

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