SUSTAINABLE WATER MANAGEMENT

Compendium of Legal Best Practices

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FOREWORD | MESSAGE FROM IRENE KHAN, DIRECTOR-GENERAL, IDLO

Water is the foundation of life and also of sustainable development. Yet current development models are driving the planet towards a crisis of water scarcity. There are over 7 billion citizens today and scarcity is being felt most acutely by the most poor and vulnerable who do not have reliable water access even in the 21st century. Water cuts across sectors: it is fundamental for food production, energy, human health, industry, and peace and security. It is considered a valuable resource by all. But its competing uses and increasing scarcity makes water management a complex issue. The world needs nuanced, yet strong, responses that engage citizens, companies and governments to act towards the common goal of water for all.

Laws can play a key role in achieving this aim. For instance, in South Africa, access to water is a constitutional right. This right is not absolute; it does not obligate the government to provide all citizens overnight with safe drinking water but by giving access to water a legal expression, it does commit the authorities to do everything in their power, within reason, to extend this right as a matter of urgency. Moreover it gives citizens a foot to stand on, a foundation to engage with their neighbours, authorities and the courts to combine efforts to make this right a reality accorded to all. Millions are thought to have benefitted from this law.

This volume, Sustainable Water Management: Compendium of Legal Best Practices, outlines inspiring examples across the developing world of new water laws and institutions. It highlights actions that are securing a more equitable and sustainable management of shared water resources. For example, Kenya's Water Law empowers a dedicated government body focused on sustainable water management, separating this function from water delivery services. In Jakarta, Indonesia, community organizations are managing their own water provision under contracts with private utilities. Under the Zambian water law, the Devolution Trust Fund has been created to attract and manage funds for providing water access in poor, informal settlements.

The laws and regulations documented in this Compendium work because they are flexible and encourage creative, collaborative action. The experiences highlighted do not offer "cut and paste" models, they are deeply specific to their societies, economies, environments and cultures. Rather, they demonstrate how strong political will may deliver bold laws and secure benefits for individuals, societies and economies alike.

This Compendium clearly demonstrates that water resources can be managed in a manner that respects human rights and benefits those most poor.

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PREFACE BY DR. SALMAN M.A. SALMAN

Water is a scarce and finite resource, without an alternative, and upon which humanity depends wholly for its survival. The challenges facing this resource are tremendous – population increases, urbanization, environmental degradation and climate change, to name a few. The world community has realized those challenges since the early 1970s, and has since been debating and considering various ways to address them. The consensus has been that the multi-faceted challenges facing water resources management require multi-disciplinary approaches. One important paradigm is the participatory approach set forth in the Mar del Plata action plan that called for management of water resources within a framework of an inter-disciplinary national economic, social and environmental development policy. Along the same lines, the Dublin Principles recommended a participatory approach involving users, planners and policy makers at all levels. Building on these statements, the European Union Water Framework Directive stressed that water is not a commercial product like any other but, rather, a heritage that must be protected, defended and treated as such.

The leading role for law in addressing the multi-faceted challenges in an inter-disciplinary setting has long been recognized. As early as 1977, the Mar del Plata conference identified the absence of adequate regulatory framework for water resources management as one major challenge. It called for adoption of water legislation that not only lays down a clear set of rules for dealing with the different aspects of water resources issues, but that is sufficiently flexible to accommodate future changes in perspectives and priorities. Indeed, the authority and ability of any government to manage, control, regulate and allocate its water resources would depend primarily on the existence of a regulatory framework that is comprehensive and flexible to address the specific needs of each group of users and uses in that country.

With these challenges and perspectives in mind, this Compendium focuses on mega-cities where close to 150 million people, mostly poor and slum dwellers, lack access to safe drinking water, and close to one billion people are without adequate sanitation. The study highlights the challenges that local governments are facing in their struggle to make water accessible and affordable to the growing population of these mega-cities. It brings to light several rich and innovative recent practices in institutional and legal reform to address the challenges and meet the increasing demands of these growing cities. The practices discussed in this study range from publicly-owned autonomous utilities, to private actors, to community managed systems. The study addresses in a friendly readable manner the reasons for success or failure in each case. More important, the study does not recommend a one-size fits all approach; rather it correctly emphasizes that the suitability of each best practice will depend on the individual circumstances of each individual city.

The menu discussed in this study is quite rich and diversified, and should provide the policy makers, planners, users and community organizations in those cities with adequate options and approaches for addressing the ever-increasing challenges of water resources management for the benefit of the growing population of these mega-cities.

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1 INTRODUCTION

Freshwater is a finite resource, essential to life, and urban centres have historically sprung up near water sources in order to develop and grow. However, today's mega-cities are consuming water resources and creating waste in quantities never before seen in human history. Mega-cities are the engines of national economies and hold great potential for reducing poverty and achieving sustainability. The development in mega-cities depends on sustained access to water, and water scarcity is imposing new limits on growth.

A historic milestone was passed in 2007 as more of the world's population now lives in urban centres than rural areas. Over 3.3 billion people live in the rapidly growing urban centres, a population expected to expand to almost 5 billion by 2030.[1] Almost all of urban population growth is expected in developing countries, with 80% of urban humanity expected to live in the towns and cities of the developing world by 2030.[2] The urban population in Asia and Africa is projected to double between 2000 and 2030, twice the historical population in just one generation.[3] Poor people will make up the majority of future urban growth.[4] Slum dwellers make up one of every three city inhabitants, which amounts to 1 billion people or a sixth of the world's population residing in areas with little access to basic services.[5] Over 90% of slum dwellers currently live in the developing world.[6] Women and girls suffer the greatest burden from the lack of access to basic services, including water, that is characteristic of slum areas. It is these women who often sacrifice livelihoods and education, and are exposed to risks of gender-based violence as they fill the gap in daily household needs.

The challenges for managing urban water resources in the 21st Century are daunting. The rapid and unplanned growth in urban populations has accelerated the scarcity of water and stress on its management. Overall improvements in drinking water sources have been achieved, but are barely keeping up with urban population growth.[7] Added to this are the multi-faceted challenges faced by mega-city water utilities, including outdated and inadequate infrastructure, limited financial resources, inadequate regulatory frameworks, and bureaucratic institutions. Climate change presents added complexity, demanding that urban water management systems are not only sufficient but also resilient and adaptive.

Mega-cities face a water crisis that is not simply about scarcity, but rather primarily a crisis of poverty, political will, inequality and power – in short, a failure in water governance.[8] Water sector reforms commonly focus on innovative technological and financial mechanisms to increase service delivery. The current water crisis requires innovations that go further, changing behaviour, attitudes and institutions to achieve a commitment to sustainable water use by all sectors of society. A proactive approach and innovative action is needed now to enable mega-cities to manage their limited water supplies in an equitable and sustainable manner.

The sustainable management of water management has many dimensions: governance, institutional, technical, economic, financial, environmental, ecological, sociological, human, cultural, among others.[9] Intertwined in each of these are questions of law, both formal and customary.[10] Thus, law has an important role to play in achieving long-term sustainable solutions to the water management crisis.

This Compendium of Legal Best Practices on Sustainable Water Management gathers a non-exhaustive collection of recent innovative legal and institutional reforms in water management around the developing world. It makes a unique contribution by focusing on the role of law, institutions and legal mechanisms in water management. The innovations described in this text include aspects of national water laws, autonomous utilities, effective water regulators, community water groups, private sector participation, water rights, financing tools, demand management, and service delivery, amongst others. It is important to note that the transferability of each legal best practice must be carefully evaluated within the context of the individual circumstances of each mega-city. Ultimately, the Compendium aims to inform and inspire about the many innovations taking place around the world by jurisdictions committed to a more sustainable and equitable management of water resources.

1 UN Population Fund, *State of the World Population 2007* (2007), 1.
2 Ibid.
3 Ibid.
4 Ibid 3.
5 Ibid 16. Also, According to UN-Habitat, a "slum household" is a group of individuals living under the same roof in an urban area who lack one or more of the following: durable housing, sufficient living area, access to improved water, access to sanitation and secure tenure. See UN, *Implementation of the Outcome of the United Nations Conference on Human Settlements (Habitat II) and Strengthening of the United Nations Human Settlements Programme (UN-Habitat): Report of the Secretary General* Doc. No. A/61/262 (2006), [8].
6 Ibid 16.
7 WHO & UNICEF. *Progress on Sanitation and Drinking-Water: 2010 Update* (2010).
8 Global Water Partnership. *Urban Water and Sanitation Services: An IWRM Approach* (2006); UNDP, Water and Governance <http://www.undp.org/water/> at 1 October 2011.
9 Professor Ramaswamy Iyer, 'Keynote Address' (speech delivered at the IDLO Legal Foundations of Sustainable Water Management seminar, Delhi, 13 October 2011).
10 Ibid.

2

INTERNATIONAL FRAMEWORK FOR SUSTAINABLE WATER MANAGEMENT

The term "sustainability" was popularized for human and environmental development in the 1987 Brundtland Report. It defined sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs."[11] The definition of sustainability implies the concept of equity; it calls for the equitable distribution of resources both spatially within a given area, and temporally between generations of users. Sustainable management of water resources thus means water that is allocated to meet the needs of all, including future generations and the environment.

The sustainable management of water resources has been recognized as a global challenge since the 1970s and has remained a controversial topic within the international community for decades. There is no clear answer to what is meant by the term "sustainable water management," although an analysis of international and regional texts exhibits the emergence of leading principles and frameworks.

A diversity of principles has been developed in relation to sustainable water management, at times conflicting, such as water as a human right vs. an economic good. An understanding of these diverse principles is critical to enable a proper assessment of the best practices in this Compendium. Each best practice is based on inherent policy assumptions that align with certain of the above principles while often rejecting others. Mega-cities aspiring to transfer aspects of these best practices to their jurisdictions must ensure that the practices reflect the principles of water management that have been broadly accepted in their own society.

International and Regional Soft Law Instruments

International non-binding soft law instruments exhibit a fragmentation of principles related to sustainable management of water resources. While many principles are mutually reinforcing, some clearly conflict, such as the divergence between the principles of water as a human right and water as an economic good.

The leading international soft law legal instruments exhibit the leading concepts of water as a human rights, water as an economic good, and equity of access issues:

- **Stockholm Declaration**, 1972: One of the earliest environmental instruments to recognize the importance of sustainable management of water to human well-being and survival.[12]
- **Mar del Plata Action Plan,** 1977: A leading international statement specifically on water issues, which declared the right of all people to drinking water in quantities and of a quality equal to their basic needs.[13]
- **Declaration on the Right to Development**, 1986: In this Declaration, the UN General Assembly called on States to commit to equity in the access to basic resources, identifying the persistent denial of access to such essentials as water in adequate measure as a flagrant mass violation of human rights.
- **New Delhi Statement**, 1990: This Statement promoted pro-poor water policies through a "some for all rather than more for some"[14] approach to drinking water supply.
- **Dublin Statement on Water and Sustainable Development**, 1992: This Statement noted the "basic right of all human beings to have access to clean water and sanitation at an affordable price"[15] and also introduced the concept of water an economic good with competing uses.
- **Agenda 21**, Chapter 18, 1992: In Agenda 21, water was defined as "a natural resource and a social and economic good, whose quantity and quality determine the nature of its utilization."[16]
- **European Water Framework Directive**, 2000: The Directive notes that "Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such."

11 World Commission on Environment and Development, *Our Common Future* (1987), [1].

12 Principles 1 and 2 recognize the fundamental right to "an environment of a quality that permits a life of dignity and well being" and that "the natural resources of the earth including...water...must be safeguarded for the benefit of present and future generations, respectively."

13 United Nations, *Report of the United Nations Water Conference, Mar del Plata. March 14-25, 1977,* No. E 77 II A !2 (United Nations Publications, New York, 1977) at Preamble.

14 UN Economic and Social Council, New Delhi Statement, 1992, UNGA Doc. A/C.2/34/3.

15 The Dublin Statement on Water and Sustainable Development, 1992, Guiding Principles – Principle No. 4.

16 Agenda 21, 1992 at para. 18.18.

2.1 INTERNATIONAL AND REGIONAL SOFT LAW INSTRUMENTS

- **Millennium Declaration**, 2000: The Millennium Declaration sets out a specific target to provide sustainable access to safe drinking water and basic sanitation, while also recognizing that access to water is relevant to the achievement of all eight Millennium Development Goals.

- **Johannesburg Declaration**, 2002: The JPOI links human dignity to the right to water, calling for the speedy increase in access to basic requirements like clean water.[17]

- **Stockholm Declaration**, 2011: States adopted the concept of "Water for All" calling on local, municipal and national governments and all major groups to commit to the universal provision of safe drinking water, adequate sanitation and modern energy services by 2030.[18]

In key international 'soft law' documents, countries provide guidance on the implementation of sustainable water management systems. Agenda 21 provides some guidance in allocating between competing uses. It declared "in developing and using water resources, priority has to be given to the satisfaction of basic needs and the safeguarding of ecosystems. Beyond these requirements, however, water should be charged appropriately."[19]

The challenge of sustainable development of urban water resources was addressed specifically in Agenda 21, Chapter 18. The section on "Water and Sustainable Urban Development" established targets for the year 2000 to ensure provision of at least 40 litres per capita per day of safe drinking water to all urban residents, access to sanitation for 75% of the urban population, and to establish discharge standards for municipal and industrial effluents. To achieve these goals, it called for the development of legislation and policies to promote investments in urban water management. It emphasized the need to utilize the skills and potential of non-governmental organizations, the private sector and local people, taking into account the public and strategic interests in water resources. Overall, Chapter 18 called for the strengthening of legal mechanisms to ensure that water policy and its implementation are a catalyst for sustainable social progress and economic growth.

17 Johannesburg Declaration on Sustainable Development, agreed to at the World Summit on Sustainable Development, Johannesburg, South Africa, August 26-September 4, 2002 (A/Conf.199/L.6/Rev.2) at para. 18.

18 The Stockholm Declaration, 2011, was released during World Water Week 2011, which focused on urban water management issues under the theme "Water in an Urbanizing World".

19 Agenda 21 at para. 18.8.

The Plan of Implementation adopted at the 2002 Johannesburg Summit included the pledge by governments to develop integrated water resources management plans by 2005 and "employ the full range of policy instruments, including regulation, monitoring voluntary measures, market and information-based tools, land-use management and cost recovery of water services, without cost recovery objectives becoming a barrier to access to safe water by poor people."[20]

These plans of action and implementation provide general guiding principles but provide few details on concrete actions aligned with them. Global consensus on concrete action has been difficult to achieve. In the face of the pressing challenges, collaborations of governments, industry and civil society groups have been emerging to foster a dialogue and promote practices. For example, the World Water Council (WWC) has organized World Water Forums to gather a wide array of water stakeholders to develop the frameworks and practices needed to prioritize and implement the various principles related to sustainable water management into action.

Box 1: Key Recommendations from 1997 World Water Council "A Water Secure World: Vision for Water, Life and the Environment" Report released in 2000.

The report set out concrete recommendations for water reform calling for innovative approaches to institutions and technology.

- to adopt an Integrated Water Resource Management (IWRM) approach,
- to create participatory institutional mechanisms,
- to institute full-cost pricing of water services with targeted subsidies for the poor; and
- for government to act as enablers, providing effective and transparent regulatory frameworks for private action.

20 Johannesburg Plan of Implementation, Article 26(b).

2.2 INTEGRATED WATER RESOURCES MANAGEMENT

The concept of Integrated Water Resources Management (IWRM)[21] presents a new, holistic way of thinking about water management that incorporates several of the principles related to water management. The concept has been defined as:

> 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 eco-systems.[22]

This definition provides a comprehensive definition of the concept of "sustainable water management". The IWRM concept highlights the three E's – economic efficiency, social equity and environmental sustainability. An IWRM-based water management system focuses on balancing all three objectives and takes concrete action towards a harmonized fulfilment of all three goals. Thus, a sustainable water management system must operate in a manner that is cost-efficient, equitable and within ecological limits.

There is no set formula for achieving IWRM, but rather it is an on-going process to respond to changing situations and needs[23] based on four fundamental principles outlined in the 1992 Dublin Statement on Water and Sustainable Development.

Box 2: 1992 Dublin Principles

Principle 1: Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
IWRM requires recognition of the ecosystem limits of water resources and the cross-cutting sectors that place demands on this finite resource. Water management requires a holistic institutional framework that coordinates the multiple human and environmental demands on water and include mechanisms to ensure users make sustainable choices in water use.

Principle 2: Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.
Real participation takes place only when all stakeholders are part of the decision-making process. IWRM promotes democratic water governance at the basin level. Meanwhile it recognizes that water problems will not be solved in water professionals working alone, but must include broad engagement of urban development and environment authorities, governments at all levels, industry, civil society and citizens themselves.

Principle 3: Women play a central part in the provision, management and safeguarding of water.
Women play a key role in the collection and safeguarding of household water but are often left out of water management decisions. Water management frameworks should recognize the different experience of women, and give them a forum to express not only their needs, but also their vision for water. This involves building participatory capacity and community organizations.

Principle 4: Water is a public good and has a social and economic value in all its competing uses.
This principle recognizes first the basic right of all human beings to access to clean water and sanitation at an affordable price. Valuing water as an economic good can reduce waste and achieve efficient and equitable use, while promoting conservation and protection of water resources.

The Global Water Partnership, founded in 1996 by the World Bank, UNDP, and Swedish International Development Cooperation Agency (SIDA), creates a network of organisations involved in water resources management, and develops resources on the implementation of the IWRM concept. These resources include the GWP Toolbox, a free and open database with a library of case studies and references for improving water management through the IWRM approach.

21 UNESCO, *The 3rd United Nations World Water Development Report: Water in a Changing World* (2009), 4.
22 Global Water Partnership, *What is IWRM* <http://www.gwp.org/The-Challenge/What-is-IWRM/> at 4 October 2011.
23 Global Water Partnership Technical Advisory Committee (Editor). *Catalyzing Change: Handbook for developing IWRM and water efficiency strategies* (2004).

2.3
HUMAN RIGHTS BASED APPROACH

An emerging consensus has formed around the concept of water as a human right. International and regional bodies and courts have been addressing its content as well as the duties and obligations on States to implement this right.

International human rights treaties and conventions have established access to water and sanitation as a legally binding human right. The 1977 Mar del Plata Action Plan was the first international text that recognized the right to water, albeit as a non-legally binding right.[24] Soon after, international treaties established a legally-binding right to access to water for women under the 1979 Convention on the Elimination of all Forms of Violence against Women (CEDAW) and for children under the 1989 Convention on the Rights of the Child (CRC). In 2002, General Comment No. 15 from the UN Committee on Economic, Social and Cultural Rights clarified that the right to water exists for all.[25] This text creates a binding legal obligation on States under the International Convention on Economic, Social and Cultural Rights to progressively take active steps to provide safe and secure access to drinking water and sanitation facilities to its citizens. The right to water was further recognized in by the UN General Assembly in its Resolution 64/292 in 2010 and by the UN Human Rights Council in its Resolution 16/2. The right to water has also been established through regional instruments,[26] in national constitutions,[27] and by interpretation through the courts.[28]

In 2008, the United Nations appointed a Special Rapporteur on the human right to safe drinking water and sanitation who has commissioned studies and produced report to define the content of the human right to water. An overall statement of this right affirms that everyone is entitled to "sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. An adequate amount of safe water is necessary to prevent death from dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking, personal and domestic hygienic requirements.[29]

Box 3: Content of Human Right to Water

Source: The Right to Water, Fact Sheet No. 35, UNOHCHR" with a footnote to this "available at: <http://www.ohchr.org/Documents/Publications/FactSheet35en.pdf

Safe: Water supplied for domestic use should be free from micro-biological, chemical substances and physical contaminants, and be of acceptable colour, odour and taste;

Sufficient: A continuous supply of water for drinking, personal sanitation, washing clothes and food preparation; at least 20 litres per person per day;

Accessible: Water facilities must be within physical reach and accessible to vulnerable or marginalized sections of the population. It should take no more than 30 minutes in urban areas or more than two kilometres in rural areas to collect water; and

The human right to water does not mean that water must be provided for free, but rather be made affordable. Nor does it demand that water provision must be public, but rather that public authorities exercise effective control over whatever form of service it chooses whether public, private or semi-private. In jurisdictions facing water scarcity and lacking water provision for all, establishing a right to water can serve as a powerful moral claim that could service as a powerful tool to mobilize all stakeholders and raise the issue on the political agenda.[30]

24 United Nations, *Report of the United Nations Water Conference, Mar del Plata. March 14-25, 1977* E/Conf.70/29 (1977), Preamble.

25 United Nations Economic and Social Council, Committee on Economic Social and Cultural Rights, General Comment No.15 (2002). *The right to water (Arts. 11 and 12 of the International Covenant on Economic, Social and Cultural Rights)* Twenty-ninth session, Geneva, 11–29 November 2002. E/C.12/2002/11.

26 The African Charter on the Rights and Welfare of the Child (1990), The Protocol on Water and Health to the 1992 Convention on the Use of Transboundary Watercourses and International Lakes (1999) and the Charte des Eaux du Fleuve Sénégal (2002).

27 These include countries in Africa (Algeria, Morocco, Eritrea, Ethiopia, Kenya, Tanzania, Uganda, Mozambique, South Africa, Zambia, Angola, Madagascar, Democratic Republic of the Congo, Gambia, Mauritania), in Asia (India, Indonesia, Bangladesh, Sri Lanka, Philippines), in the Middle East (Iran, Kazakhstan), in Latin American (Nicaragua, Panama, Uruguay, Costa Rica, Honduras, Paraguay, Peru, Venezuela, Bolivia, Colombia, Ecuador, Dominican Republic, Guatemala, Chile, Brazil), and Europe (UK, Netherlands, Belgium, France). See The Rights to Water and Sanitation, The rights to water and sanitation in national law <http://www.righttowater.info/progress-so-far/national-legislation-on-the-right-to-water/> at 2 October 2011.

28 See Narmada Bachao *Andolan v. Union of India* (2000) 10 SCC 664, 767 in which the Supreme Court of India held that, 'water is the basic need for the survival of human beings and is part of the right to life and human rights as enshrined in Article 21 of the Constitution of India and can be served only by providing source of water where there is none'.

29 UN Economic and Social Council, *Substantive Issues Arising in the Implementation of the Covenant on Economic, Social and Cultural Rights: General Comment No. 15* (2002) Doc No. E/C.12/2002/11.

30 World Water Council, *Right to Water: Moving towards a global consensus?*

A human-rights based approach to water provision creates state obligations to provide water services under three sets of principles.

Box 4: Principles of the Human Right to Water

Non-discrimination and equality
Participation and empowerment
Accountability and Transparency

2.4
GENDER ISSUES IN WATER MANAGEMENT

Gender concerns in water management have been raised in several international texts. The legal right to water was first recognized in relation to women in the 1979 CEDAW. The Dublin Principles highlight the central role of women in the provision, management and safeguarding of water. These texts recognize the need to change women's relation to water from survival to empowerment, to empower women to be not just water users but water-keepers. They do so based on the recognition that water reforms must acknowledge the different experiences that men and women have with water, and ensure that changes do not benefit one gender to the detriment of the other. Further, women and girls are the most detrimentally affected due to a lack of access to clean water as they are most often responsible for providing and storing water for their households. In today's megacities, women and girls in households who lack access to water sacrifice livelihoods and education in order to wait in line at water stations for limited access, to search for other ways to meet their household's basic water needs, and to care for family members who fall ill to water-borne diseases.

Sustainable management of water resources requires laws and institutions that recognize the different demands and priorities of women about water, and benefits from the unique knowledge that women hold on water. A system that fails to take into account women's voices will fail to produce sustainable solutions to the water crisis. Meanwhile, failure to solve the water crisis would make development that upholds women's human rights impossible. Thus, women have a key role to play in the path forward to more sustainable and equitable water management. The IWRM concept recognizes the importance of a participatory approach to water management. Experience has shown that no water system can be sustainability and equitable without the genuine community participation in decision-making. The voices of the most vulnerable and marginalized individuals need to be heard; especially those who have been historically discriminated against or neglected such as the urban poor and women. It calls for the creation of laws that institutionalize the equitable participation of men and women, developing institutions that are gender-sensitive and have sufficient expertise in gender analysis and mainstreaming.

3

LEGAL AND INSTITUTIONAL BARRIERS TO SUSTAINABLE WATER MANAGEMENT IN DEVELOPING COUNTRY MEGA-CITIES

Legal and institutional frameworks play an essential role in enabling sustainable and resilient water resources management. Water legislation converts policy into law, providing clarity and security for all actors in sustainable water management. The Global Water Partnership has noted that a legal framework serves at least three essential purposes related to water management:[31]

- Identifies the legal rights and obligations tied to water use and delineates the parameters for resource development and management;
- Provides tools for ensuring the continuous integrity of the regime through providing governance structures, mechanisms for monitoring and evaluation and compliance and dispute resolution tools; and
- Allows for modifications of the existing regime in order to be able to adapt to changing needs and circumstances.

The major legal and institutional barriers to achieving sustainable water management in mega-cities include the lack of coherent legal frameworks, freedom from political influences, lack of engagement of all water stakeholders, need for improved achievement of social and environmental objectives, requirement of innovative financing and need for resiliency to climate change. A collection of best practices is presented in the following section in response to these challenges.

31 CWP Toolbox, "Legal Frameworks", online at <http://www.gwptoolbox.org/index.php?option=com _tool&cat_id=5>.

4

LEGAL BEST PRACTICES IN SUSTAINABLE WATER MANAGEMENT

This section outlines selected global best practices in legal and institutional reform aimed at addressing the challenges of sustainable urban water management. The term "best practices" is inherently subjective, and in this Compendium refers to practices that have been cited as success stories for achieving improvements in water management within the implementing jurisdiction. This collection of best practices is by no means exhaustive, and has been gathered through desk reviews and interviews with leading water law experts and water management specialists around the world. While an effort has been made to highlight innovations in other developing country mega-cities, best practices at the regional level, national level and in smaller urban centers have been included when they offer promising aspects that could be adapted to the mega-city context. Readers are invited to consider this a living text, to which suggestions for additions will be welcomed by the authors.

The idea of best practice laws is to identify laws or practices with positive or innovative elements that might be transferable to other frameworks with due consideration of their own social, economic and environmental context. The objective is that by understanding these initiatives, developing country mega-cities may be able to evaluate whether a similar initiative could be employed successfully in their own jurisdiction. In the very least, these best practice laws can initiate the brainstorming process and highlight particular hurdles that other jurisdictions have overcome.

4.1
LEGAL ASPECTS OF GOOD GOVERNANCE

Megacities call for a reassessment of traditional models of urban governance. Within mega-cities, suburbs are the size of small cities, yet still tend to be governed by suburban regulations. Devolution of decision-making and responsibilities down to municipalities, boroughs and civil society can lead to a more sustainable and equitable model of governance.[32] Water, in particular, is an issue that concerns all sectors of society. Water management should involve broad sectors of society, from industry, community user associations, entrepreneurs and NGOs. Governments are exploring ways to partner with these organizations, recognizing the strengths of each type of organization and creating a multi-stakeholder management system that meets financial, social and environmental objectives.

4.1.1

Comprehensive Legislative Framework

In many jurisdictions, water is regulated by a multitude of sectoral laws and/or policies that may be contradictory or inconsistent. A comprehensive water law helps to ensure that policies are achieved by defining a central vision to ensure social, economic and environmental objectives, setting out roles and responsibilities of the state, water users and providers, and creating mechanisms for implementation, coordination and enforcement. Such legislation can manage multiple stakeholder and sectoral demands, coordinate actions of the institutions involved in water management, and foster a culture of long-term and sustainable planning.

The drafting of a national water law inherently incorporates principles of water management considered appropriate within the nation. Some acts define water rights and ascribe them to the state or private property owners. Others declare water as a public good, with concessions or licenses granted to users. Newer acts focus on the protection of water resources through sustainable water management and creating fines and penalties for pollution of water sources. A recent trend is the recognition of the right to water as a legal or constitutional right.[33]

These legislative frameworks are most commonly implemented at the national level, but are nonetheless still relevant to the mega-city context.

32 UN Habitat, "Feature/Backgrounder on the State of the World's Cities 2006/7" online: <http://www.unhabitat.org/documents/media_centre/sowcr2006/SOWCR%202.pdf>.

33 International Environmental Law Research Centre, "Selected Water Law Instruments Around the World" online: <http://www.ielrc.org/water/doc_countriesmis.php>.

Box 4: Key components of a comprehensive water law

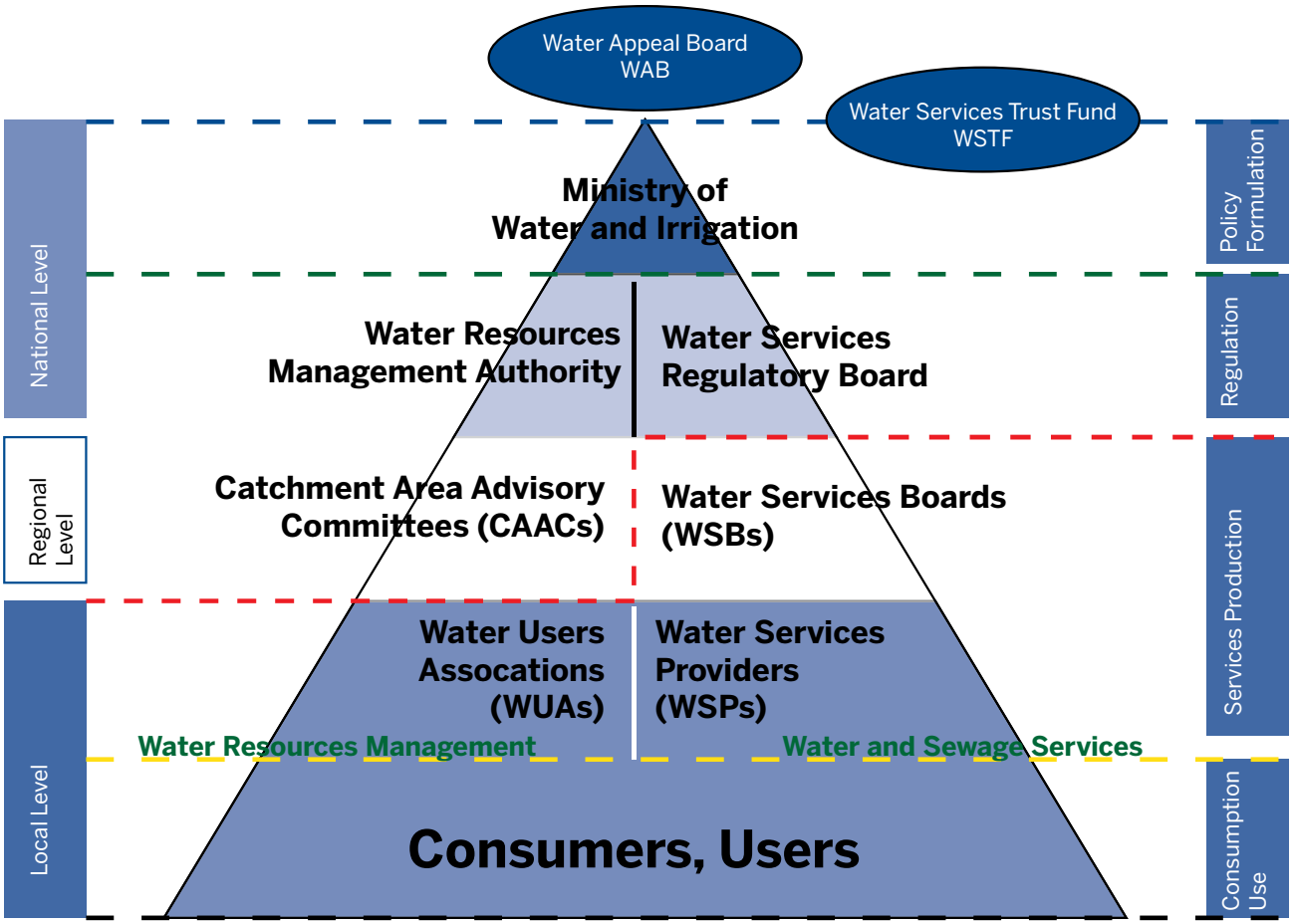
(Source: UN Economic and Social Council, "Module Three: Legislative and Organizational Frameworks", Workshop on "Training of Trainers on the Application of IWRM Guidelines in the Arab Region", Kuwait, 14-18 May 2005, UN Doc. E/ESCWA/SDPD/2005/WG.1/4 (14 April 2005).

- **Clear mandate** for a national water authority and its sub-entities;
- **Organizational clarity** by defining the roles and linkages of cross-sectoral institutions;
- **Adherence to existing rights and legal framework**, including recognition of customary rights and repeal of any inconsistent laws;
- **Economic, social and environmental objectives**, including tools to achieve them such as limits on water use and water quality standards;
- **Financial framework** including state budget allocations and subsidies;
- **Integrity** of the institution, by establishing clear criteria for decision-making and participatory approaches that engender trust;
- **Appeal process** that is clear, simple and subject to timelines; and
- **Sanctions and penalties** through concrete tools in terms of fines, imprisonment, and changes in permit condition

Over the last decade, water legislation and institutions have been reformed significantly in **Nairobi, Kenya** in a manner that shows a particular commitment to sustainable management of water resources. The Water Act 2002 provides the basis for water sector reforms by setting out a comprehensive institutional framework with roles for all sectors of society at all levels of government. The Ministry of Water and Irrigation is responsible for overall oversight including policy formation, coordination and resource mobilization. The Water Act 2002 is innovative in that it separates and creates two separate autonomous public agencies, the Water Resources Management Authority for water resources management and the Water Services Regulatory Board for water and sewerage services provision.[34] This separation was made in recognition of the fact that the water utilities were increasingly focusing on water delivery at the cost of sustainable water resources. The Water Resources Management Authority undertakes initiatives for improved land use practices, afforestation and biodiversity conservation to enhance water availability and quality. It shares funding with the Water Services Regulatory Board from water charges and tariffs, government budgets and donors.

Figure 1: Institutional Framework for Water Sector in Kenya

Source: Suzanne Wymann von Dach. (2007) *Water sector Reform in Kenya: First experiences are positive* (Berne: InfoResources).



The Water Act 2002 also defines clear roles for consumers and users to both participate in decision making through the Water User Associations and also service delivery itself as Water Service Providers (WSP). WSPs can be companies, NGOs, community groups or persons, but must register under the Societies Act, Chapter 108 of the Laws of Kenya. In recognition that registration may be cumbersome in some areas, the Act creates the Water Services Trust Fund, which provides direct funding to micro-projects at the community level. To resolve disputes in the water sector, the Act creates a Water Appeal Board. Ultimately, the Water Act 2002 features four main principles: the separation of water resource management from water provi-

34 Kenya *Water Act*, 2002, Parts III and IV.

sion, the separation of policy-making from regulation, decentralization to lower level state bodies, and engagement of non-government entities in water management and provision.[35]

4.1.2

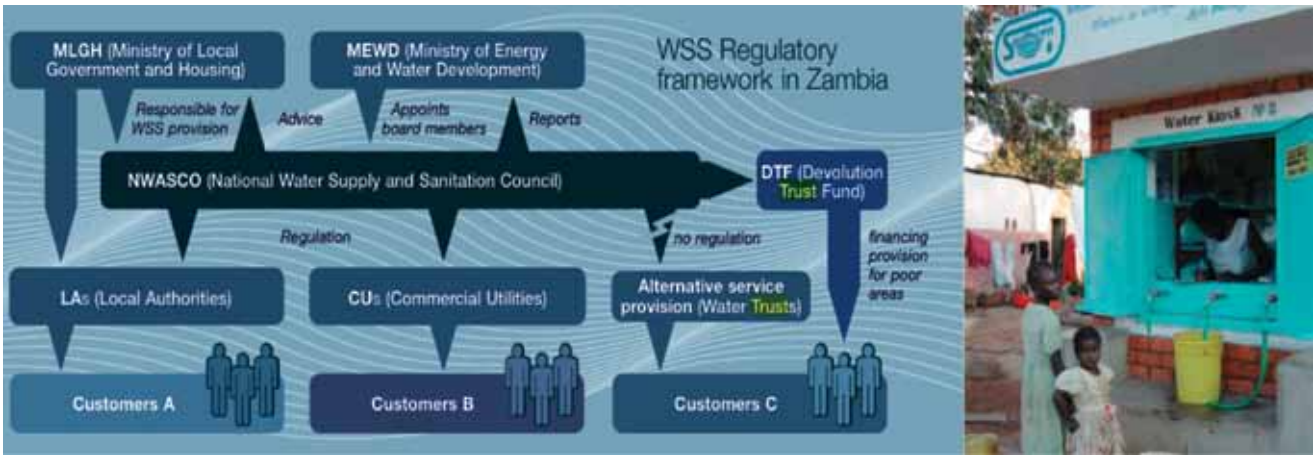
Legal Elements of Water Regulators

Independent regulators can play a key role in setting and upholding standards to ensure an equitable, sustainable and affordable provision of water. Effective regulators have adequate financial support and freedom from political influences to carry out their mandates. The mandates and structures of water regulators vary around the world, in accordance with local and regional situations.

The Water Supply and Sanitation Act No. 28 of 1997 of **Zambia** establishes a national water regulator, the National Water Supply and Sanitation Council (NWASCO), as the focal point for the country's water management and defines clear roles for government, private industry and community groups.[36] Zambia is one of the most urbanized countries in sub-Saharan Africa with around 43% of its 10.7 million citizens living in urban areas. The NWASC is a single centralized but independent corporate body that reports to Parliament through the Ministry of Energy and Water Development (MEWD). The responsibility for developing policies on water and sanitation is assigned to the Ministry of Local Government and Housing, which ensures a clear separation between policy and regulatory functions. The main functions of the NWASCO are to advise government institutions, license and advise utilities and other service providers, develop sector guidelines for water supply and sanitation, establish and enforce standards of the design and management of utilities, and disseminate information to consumers. The NWASCO membership consists of seven (7) members representing several sectors: consumer protection, the Chamber of Commerce, the water sector profession, the private sector concerned with public health, the Ministry of water resources, the Ministry of local government and housing, and the Attorney General. Section 7 of the Act allows for the appointment of a Chief Executive Officer, among others, responsible for the day-to-day management of the Council's responsibilities.

Figure 2: Regulatory framework for water supply and sanitation in Zambia

Source: GTZ. (2006) *Casesheet Focus: Zambia, Regulation and Supervision in Water Supply and Sanitation* (WSS).



NWASCO has developed several mechanisms to fulfill its legal obligation to monitor the water sector, advise stakeholders and encourage efficient and accessible water delivery. The Act mandates the appointment of inspectors to collect information, verify inspections and investigate consumer complaints. An information system with key data including socio-economic data was established and is regularly updated with information from the service providers. NWASCO invests in its employees by providing on-going training and rewarding performance and innovation. NWASCO ranks and rewards the various commercial service providers in an annual report to promote competition towards better service delivery. It fosters close personal relationships with each water service provider by appointing a direct contact person for each provider who attends to their issues. It has also established

35 Kenya Water for Health Organisation. (2009) *Human Rights Based Approach to Reforms in Kenya Water Sector.*

36 GTZ Case Sheet, "Focus: Zambia, Regulation and Supervision in Water Supply and Sanitation (WSS)" (January 2006).

incentives to encourage innovation and efficiency in service delivery by its private (and public) service providers. These include a tariff setting mechanism designed to stimulate efficiency and incentives for improved human resources.

To meet social objectives, NWASCO requires service providers to commit to minimum service level guarantee suited to their service area in an agreement. The boundaries of service zones under each contract are purposely drawn to include mixed-income households that include low-income neighborhoods. The Zambian scheme also utilizes cross-subsidization and social tariffs to subsidize the urban poor. However, the cross-subsidization has achieved disappointing results, with 60% of the urban poor still without water access. This failure has been attributed to the fact that the country has a consistently low household income that means there are few "rich" citizens to subsidize the "poor." Overall, however, the system is more financially and operationally sustainable.

NWASCO also has "teeth" to enforce its decisions. It controls the licensing and tariff setting process and may issue enforcement notices and penalties. A service provider may appeal a decision to the Minister of Energy and Water Development, with appeals to the High Court and then Supreme Court.

In **Mozambique**, the Water Regulatory Council (CRA - Conselho de Regulação do Abastecimento de Agua) was established by a Decree of the Council of Ministries (Decree 74/98). The CRA's mandate is to regulate the water services by private entities in 11 cities across the nation, including the capital of **Maputo**. Its mandate is to ensure the financial stability of the private operators and to guarantee affordability and water safety standards for people in poverty, particularly in slums. The Council employs non-traditional models and focuses on understanding on-the-ground realities. It promotes restructuring of tariffs to ensure affordability and establishing flexible payment schedules for connection and water use costs. Informal service delivery is recognized and supported, including the resale of water from a neighbour's tap.[37]

In **Kenya**, the Water Services Regulatory Board was created under the Water Act 2002 with powers to develop regulations and minimum standards, approve water tariffs and ensure social objectives. Under the previous Act, the Ministry of Water was responsible for setting tariffs, which created a political and time-consuming process. In light of this, tariffs remained static over several years, distorting the actual water costs. The newly established Water Services Regulatory Board has set new tariffs that have started to improve the earlier distortion. The Board also directly fosters community participation in water management decision by assisting communities to form Water Users Associations, requiring service providers to set up accessible complaints mechanisms, and publishing an annual report on performance by the utilities.[38]

4.1.3.

Legal Elements of Autonomous Water Utilities

In mega-cities around the world, the dominant trend in the institutional arrangement of water utilities is one of an autonomous governance structure.[39]An autonomous water utility is distinguished by independence in decision-making that may or may not be limited by external factors, such as legislation, river or watershed-based jurisdictional boundaries and political constraints.

In **Lusaka, Zambia**, a city with a population of 1.7 million, the water utility is structured as an autonomous limited liability company called the Lusaka Water and Sewage Company (LWSC). The LWSC was incorporated in 1988 through a City Council resolution, enabled by provisions of the Water Supply and Sanitation Act (WSSA) passed by the Zambian Government in 1997. The WSSA focuses on a commercialization, rather than privatization, of the water sector. This aligns with the Zambian Government's long-standing decentralization strategy that calls for neo-liberal principles to influence water management decisions.[40] The LWSC operates under a contract with the national regulator operating on principles of full-cost recovery, dynamic working environment, and focus on customer care. All O&M costs are to be covered by charges it levies for water services, but capital project funding has been secured from international development assistance.

The LWSC has grown in financial stability over the years, recording a small surplus in its budget in 2009 after years of

37 UN Best Practices, supra note ??? at 8.

38 UN Best Practices, *supra* note ?? at 7.

39 Baietti, A., Kingdom, W., van Ginneken, M., "Characteristics of Well-Performing Public Utilities" Water Supply & Sanitation Working Notes (Note No. 9, May 2006) online: <http://vle.worldbank.org/bnpp/en/publications/energy-water/characteristics-well-performing-public-water-utilities>.

40 National Water Supply & Sanitation Council, Urban and Peri-Urban Water Supply and Sanitation Sector Report 2010/11.

budget losses. Most recently, the LWSC reported 77.5% access to potable water in comparison with 45% in 2002, improved hours of water services and an increase in installed meters. However, concerns remain about low water quality, high turnover of staff, lack of service extension to the urban poor, and high rates of unaccounted for water.[41] However, key lessons can be learned from the Lukasa experience. The city has an overall low household income so cross-subsidies are unlikely to be effective in extending service to the urban poor. Thus, it is critical for the regulator to set, monitor, and enforce objectives for the commercial water utility that reconcile the inherent tension between social policy goals and economic efficiency.

The **Phnom Penh** Water Supply Authority (PPWSA) has been hailed by the Asian Development Bank as a model public sector utility. It transformed its post-war water system to now operate on full cost recovery basis, with an estimate coverage level of 100% and 24 hour water supply. WaterAid claims that the PPWSA's strength is its high management competence and leadership. The company director personally championed the institutional reform, working to create a "culture of change." The overall management was restructured to improve commercial practices and customer care. The managing director maintains a direct connection with users.[42]

Box 4: Characteristics of Pro-Poor Utilities

Source: Yael Vellemen, "Water utilities that work for poor people" for WaterAid (November 2009).

1. Assessment of user needs, preferences and capabilities;
2. Pro-poor utility policy;
3. Targeted implementation strategy and specialized pro-poor unit; and
4. Flexible service delivery.

These foregoing best practices raise the question: Do well-run autonomous water utilities illustrate specific features? A 2006 Report[43] listed "characteristics of a well-performing public utilities" and highlighted the following aspects: establishment of management policies, practices, strong reporting requirements and completion of internal audits, input into management goals for tariff setting, procurement oversight, control over staff hiring, incentive-based review protocols including training programs, staff subject to both reward and penalty systems, and the inclusion of external and community members on the governance board. Based upon a case study research approach, these researchers highlight the several characteristics of well-run autonomous public utilities that have managed to achieve both economic and social objectives.

For example, **Johannesburg Water** in South Africa sets tariffs to ensure the recovery of O&M costs and the surplus revenues are transferred to the City. However, the National Water and Sewerage Corporation (NWSC) in **Uganda** also sets tariffs to cover O&M but the recovery of investment costs is limited. The Haiphong Provincial Water Supply Company (HPWSC) in **Vietnam** has set flexible salary scales and offers bonuses based on internal finances. It is reported that the bonus structure is considered a major component of a staff's total compensation and creates a strong incentive for performance-related results in customer service and service extension. Yet, the authors caution that their research also demonstrates the limits placed by government labor laws that might constrain independent hiring and firing decisions. Even though HPWSC is interested in hiring more staff it is restricted in its ability to terminate existing staff. Staff training based upon ISO 9001 certification is also an important feature for utilities such as SANASA, **Brazil** and NWSC, **Uganda**.

In summary, an autonomous water utility is influenced by socio-economic political factors that can allow for, as well as constrain independence in decision-making. In mega-cities around the world, water managers continue to struggle with designing a responsive water governance arrangement that reflects the complexity of the water management sector. Several global cities are experimenting with innovative solutions such as setting tariffs that are politically acceptable but also requiring that a portion is set aside to contribute to other societal goals like watershed conservation and forestry programs. The ideal of an autonomous water utility inherently privileges the economic and efficiency needs of water management at the cost of the social and political implications of the same.[44] A fine balance must be struck, which remains a continuing global challenge.

41 *Ibid.*
42 Yael Vellemen, "Water utilities that work for poor people" for WaterAid (November 2009).
43 A. Baiette, W. Kingdom & M. van Ginneken, World Bank Water Supply & Sanitation Working Note No. 9 (May 2006).
44 Interview with Ms. Roopa Madhav.

4.1.4

Legal Elements of Community Water Governance

In many areas of regulation, there has been a growing demand for more inclusive approaches to decision-making and the formulation of public policies.[45] Participatory governance is becoming increasingly important in water regulation, as governments understand that more sustainable systems are developed with greater stakeholder participation in water management. Clear opportunities for civil society, communities and individuals to access information and participate in water governance leads to more sustainable water policies that equitably account for the water needs of all citizens.

In **Jakarta, Indonesia** community-based organizations are partnering with private water utilities to provide cost-effective and reliable water supply in informal neighbourhoods.[46] Community organizations sign supply contracts with the private water utility, taking responsibility for the supply, management and maintenance of a master water meter. The private utility offers a special tariff rate in recognition of the fact that the meter is being used by several households. The private utility benefits from lower overhead and administrative costs, and the Government benefits as water is being supplied in informal areas in which it lacks clear authorization to operate.

The model of community-management of water resources was implemented in the capital city of **Antananarivo, Madagascar** where Water Users Associations (WUA) are investing community resources and developing community business plans to build and manage water standpipes. The Code de l'Eau of 1998 (Water Code) of Madagascar mandates the creation of neighborhood WUAs that manage public tap stands and charge a fee that is applied towards operation and maintenance costs. Nearly 700 WUAs in Antananarivo actively manage over 1,000 public tap stands.[47] The Code mandates the cost recovery system and requires the WUAs to reinvest the revenue raised in water infrastructure or water supply related initiatives. Affordability is achieved through social tariffs, tax exemptions and phased-payments for installation. The city water utility also charges a consumption tax on water consumption overall to pay for further water kiosks and network extensions.

In **Porto Alegre, Brazil** with 1.5 million inhabitants, the public water utility has created a robust public participation mechanism that allows citizens to exert influence over the management of the city's water system.[48] Each year's budget is determined through a participatory budgeting mechanism where the 16 regions are consulted and allowed to vote on priority areas for improvement in the coming year. The ideas are studied for feasibility and then incorporated into the following year's budget. This mechanism is run by the municipally-owned utility, which has financial and operational autonomy, the Municipal Department of Water and Sewerage (Departamento Municipal de Água e Esgotos (DMAE)). It is a ring-fenced entity that receives no government subsidies with water tariffs linked to water consumption (previously the tariff was a property tax). Its operating mandate combines both social and commercial objectives, allowing it to develop innovative tools such as the participatory budgeting. The DMAE was created as a public utility at a time that the Inter-American bank was successfully pressing other Brazilian cities for the privatization of their water utilities.[49] The DMAE has achieved universal access to water, amongst the lowest water prices in Brazil, a 3:1000 employee to household connection ratio and efficiency indicators similar to best-performing private companies.

The national regulator in **Zambia** was established with a mandate to ensure improved service delivery and sustainability, and safeguard consumers from exploitation under the Water Supply and Sanitation Act 1997. The NWASCO institution is lean with offices in **Lusaka** only and thus relies on volunteer community groups to be "the regulator's eye on the ground". NWASCO created Water Watch Groups (WWG) made up of citizen volunteers from each service area. The first WWG was established in Lusaka, the capital city. The WWGs educate consumers about their rights and obligations, assist in resolving complaints and provide feedback to the national water regulator, the NWASC. WWGs receive financial support in the form of grants from NWASCO. NWASCO delegates to the WWGs the authority to deal directly with the service provider to handle customer complaints. While service providers initially viewed the WWGs

45 Peter Rogers and Alan Hall, "Effective Water Governance", (Global Water Partnership Technical Committee) (2003).

46 Fournier, V., Folliasson, P., Martin, L., and Arfiansyah. PALYJA "Water for All" programs in Western Jakarta (2010).

47 Water and Sanitation for the Poor, "Responding to demand: how urban WASH service providers are reaching low-income urban consumers at scale", Topic Brief, #003 (August 2011).

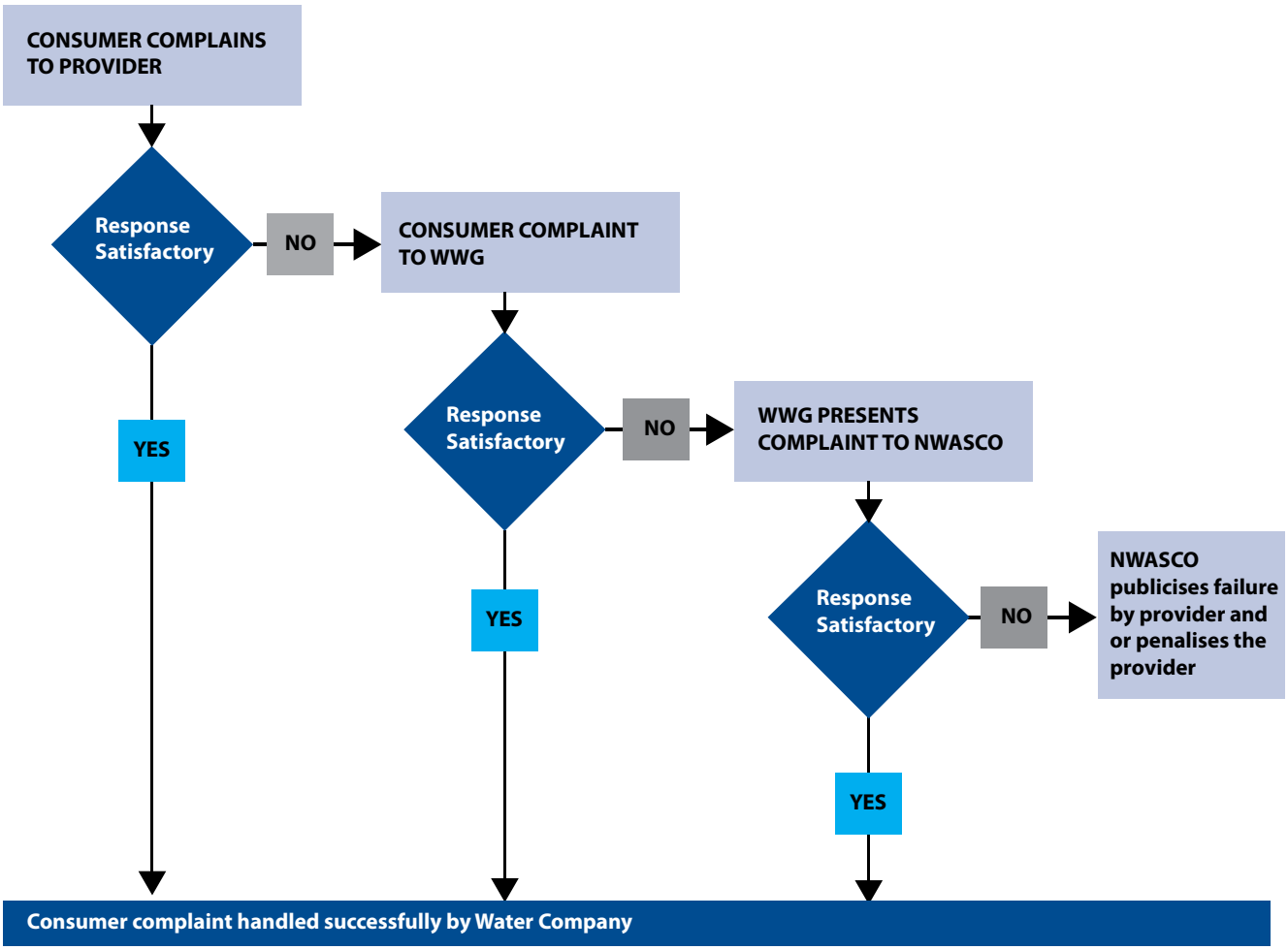
48 Water Commons, "Water Solutions, Case 10: Public Management of Water in Porto Alegre, Brazil" online: <http://ourwatercommons.org/water-solutions/case-10-public-management-water-portoalegre -brazil>.

49 UNDP CAP-NET, Streams of Law: a training manual and facilitators' guide on water legislation and legal reform for integrated water resources management (June 2010).

as adversarial consumer watch-dogs, they have started to recognize the value of WWGs in reducing conflict by providing an effective venue for communication and understanding of both consumer and service provider issues. WWG members apply for membership with detailed CVs and are drawn from all sections of society. They receive training on the legal framework, performance requirements expected of providers and the consumer complaint procedure shown below in Figure 3. WWG members sign a Memorandum of Understanding (MOU) with NWASCO for a renewable period of one year. This model has been so successful that the energy and telecommunications regulator have signed an MOU with NWASCO to form Consumer Watch Groups with similar functions as the WWGs but encompassing all three sectors: energy, water and telecommunications.[50]

Figure 3: Customer Complaint Mechanism in Lusaka, Zambia

Source: NWASCO, "Water Watch Groups: Involving Consumers in Monitoring Water Supply and Sanitation Services in Zambia".



NWASCO employs another tool to engage and grant the right to information for the general public to assist in ensuring satisfactory service provision. It releases an annual public "yardstick competition" assessment that compares the various commercial water utilities operating across the country on several metrics. The report is made available to the public, and is intended to enable the media and public to exert informed pressure on the commercial utilities to achieve social policy objectives, by comparing realistic metrics of progress set by the performance of competing utilities.

50 NWASCO, "Water Watch Groups: Involving Consumers in Monitoring Water Supply and Sanitation Services in Zambia".

Community involvement in the management of water resources has proven especially effective in areas considered financially "unattractive" to purely private investors. It provides a model that may better meet pro-poor needs while ensuring financial sustainability. However, criticisms have been targeted at the manner that community participation has been incorporated into water management plans. Fears have been raised that the Water Users Associations as structured fail to have democratic legitimacy, and will likely be controlled by the already powerful. Rules to ensure equal participation by women and disadvantaged groups will be necessary to ensure truly democratic management of water resources.[51] The "powers" granted to communities to manage their own water resources can also be viewed rather as burdensome "responsibilities" that the government has dumped upon communities without adequate support.[52]

To avoid this situation, adequate and ongoing technical assistance by NGOs or international organisations has been recommended to ensure the sustainability of community-managed water systems.Civil society can play an important role in facilitating community involvement in water reform, by assisting communities to gradually build up capacity, raise awareness and monitor and enforce water rights and obligations. The **Kenyan** Water Services Trust Fund, under the Water Act, 2002, grants funding to Water Service Providers who bid for projects to service the urban poor. The multi-stakeholder teams are expected to include participation from local NGOs who play key roles in citizen engagement and ensuring equity.

4.1.5

Legal Elements of River Basin Management

Water management at the river basin level is promoted to secure a more holistic and coordinated system of governance over interlinked water resources. A river basin is a closed hydrological region within which water uses are interlinked. River basin management promotes water governance that recognizes and respects natural hydrological cycles and the interlinked nature of water uses. Mega-cities would benefit from coordinating their water use with that of surrounding communities in River Basin Councils to prevent overexploitation and inequitably distribution while ensuring water sustainability within the entire river basin area.

Mexico is one example of a country that has decentralized its water management to the river basin level. Mexico's Constitution tends towards centralization.[53] However, since a constitutional reform in 1982, drinking water and sewage have been the responsibility of municipal governments. As administrative reform continued, decentralization became a strong theme in many aspects of water governance. The National Water Law of Mexico was adopted in 1992, and sought to improve social participation and decentralization in water management.

Box 4: River Basin Management under Mexico's National Water Law

Source: Fabiala Tabora, Chapter 3: Integrated Water Resources Management in *Solutions from the Regional Policy Dialog on Water and Climate Change Adaptation in the Americas* (2012).

Mexico's National Water Law declares:

- The basin together with aquifers are the basic territorial unit for IWRM.
- The decentralization and improvement of water resources management by river basin, through governmental River Basin Organizations as well as multi-stakeholder River Basin Councils and River Basin Commission at the sub-watershed level, along with Technical Groundwater Committees (COTAS) charged with recovering overexploited aquifers and Clean Beach Committees focused on restoration of beach area.
- Criteria of decentralization and openness to multi-stakeholder participation - authorities, users, social sectors, as well as indigenous peoples and communities - to promote a management approach that is comprehensive, pluralistic, participatory, rational, equitable, productive and sustainable.

Specifically, it established 13 River Basin Councils for integrated water resource management. The membership of the Councils includes federal, state and municipal authorities, water users and varied stakeholders in decision-making relating to the

51 Philippe Cullet, "Water Law in India: Overview of Existing Framework and Proposed Reforms", IELRC Working Paper 2007-01, online: <http://www.ielrc.org/content/w0701.pdf> at p. 9.

52 *Ibid.*

53 Christopher N. Behre, "Mexican Environmental Law: Enforcement and Public Participation Since the Signing of NAFTA's Environmental Cooperation Agreement, *Journal of Transnational Law & Policy*, Vol. 12, No. 2 (2003).

planning, management and development of water resources. A Technical Groundwater Committee was established, composed of users of the aquifer with technical support from authorities, to formulate, promote and implement programs to stabilize and recover overexploited aquifers and preserve groundwater supply.

The impact of these River Basin Councils is said to potentially represent a "progressive step forward in using integrated water resources management strategies to resolve conflicts, conduct long-term planning, and develop more sustainable outcomes within a watershed."[54] There are still challenges that limit the effectiveness of these entities, including limitations on the Councils' jurisdiction and the weak enforcement powers. Nonetheless, these Councils codify citizen participation into new processes and institutions and have strong potential for resolving conflicts.[55]

Similarly, **Peru** has attempted to improve its participatory governance in its water regulation, specifically in relation to river basins. Peru suffers from extensive water pollution. Most of the country's water resources are located in the forest and mountainous areas, which have low population densities. On the other hand, the populated coastal plans suffer from severe water shortages and risk flooding on an annual basis. Moreover, the majority of Peru's rural population does not have access to water.[56]

In order to address the varied interests and regional disparities, Peru started to decentralize its laws in the 2000s via a regional government law and a municipalities' law, which in turn made it possible to improve participatory governance and create institutions at the river basin level. In 2003, regional governments were given more power on water quality, management, operations and the maintenance of public infrastructure. The draft Peruvian National Water Resources Management Strategy of 2004 (Estrategia Nacional para la Gestion de los Recursos Hidricas Continentales del Peru) put in place a stronger regulatory framework, and improved participatory governance by giving River Basin Authorities the responsibility for the operation and maintenance of irrigation systems as well as allowing them to participate in decision-making. These developments were continued in the Peruvian 2009 Water Resources Law. Participatory governance is a cornerstone of this law, making space for numerous actors and stakeholders. Fourteen local branches of river basin authorities based in hydrographic regions (Autoridades Administrativas del Agua) and local water authorities (Autoridades Locales de Agua) from certain river basins have been given limited powers in water management. The law also establishes river basin councils (Consejos de recursos hidricos de cuenca) that receive financial income from the shared water abstraction fees that the National Water Agency provides. Regional governments play a role in operating and maintaining major public hydraulic infrastructure, as well as local governments. The Law is also more inclusive of indigenous and campesino communities' rights.[57]

4.1.6

Legal Elements of Transboundary Water Management

Sustainable and equitable management of water resources requires adequate frameworks to manage transboundary water issues, both related to surface and groundwater. This concept should be especially relevant to mega-cities, who often have water footprints that extend far beyond their geographic borders. Efforts at coordination require the definition of key principles of transboundary water management, and commitments to common goals. While actual management will generally occur at the river basin level, agreements that allow centralized coordination amongst several river basins on certain issues can offer a critical tool for dealing with major transboundary issues.

The Amazon Cooperation Treaty (ACT) was signed in July 1978 by **Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela**, aimed at promoting joint actions towards the harmonious development of the Amazon Basin.[58] The goal of the "Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin" project is to strengthen the institutional framework for planning and executing activities for the protection and sustainable management of the land and water resources of the Amazon

54 Margaret Wilder, "Water Governance in Mexico: Political and Economic Aperatures and a Shifting State-Citizen Relationship, Ecology and Society, Vol. 15, No. 2, Art. 22, online: <http://www.ecologyandsociety.org/vol15/iss2/art22/>.

55 *Ibid.*

56 USAID Land Tenure and Property Rights Portal, "Country Profile: Peru", online: <http://usaidlandtenure.net/usaidltprproducts/country-profiles/peru>.

57 Barbara Deutsch Lynch, "Equity, Vulnerability and Water Governance: Responding to Climate Change in the Peruvian Andes" (2010) online: <http://www.icid18.org/files/articles/566/ 1277944530.pdf>.

58 Amazon Cooperation Treaty Organization, "ACTO", online: <http://www.otca.org.br/en/organization/index.php?id=101>.

River Basin in a coordinated and coherent manner.[59] The project seeks to implement a shared vision for the sustainable development of the region, based upon the protection and integrated management of transboundary water resources.

The United Nations Economic Commission for **Europe** adopted the Convention on the Protection and Use of Transboundary Watercourses and International Lakes in 1992. The Convention recognizes that the inter-related nature of water use, that any jurisdiction, small or large, shares the same water resources with other jurisdictions and depend on each other to ensure its equitable and sustainable use. The Convention commits all signatories to prevent pollution, use equitably and ensure conservation and restoration of ecosystems. It adopts the principles of polluter-pay, precautionary and intergenerational equity, principles that have been established under international environmental law.

The Convention takes a holistic approach based on the understanding that water resources play an integral part in ecosystems as well as in human societies and economies.[60] A 2003 amendment to the Water Convention allowed accession by countries outside the UNECE region, thus inviting the rest of the world to use the Convention's legal framework and to benefit from its experience.[61]

59 UNEP Global Environment Facility, "Project Document: Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin", online: <http://www.otca.org.br/arquivosdoc/projetogef.pdf>.

60 United Nations Economic Commission for Europe, "About the UNECE Water Convention", online: <http://www.unece.org/env/water/text/text.html>.

61 Philippe Cullet, "Water Law in India: Overview of Existing Framework and Proposed Reforms", IELRC Working Paper 2007-01, online: <http://www.ielrc.org/content/w0701.pdf>.

4.2
LEGAL ASPECTS OF FINANCING WATER FOR ALL

Mega-cities need new and innovative forms of financing to ensure adequate infrastructure and service levels for the rapidly growing urban population. Utilities that strive for full cost recovery must also consider obligations to provide basic levels of service to all citizens equitably and sustainably. The provision of water, as a public good with competing uses, will require financial innovation and input from all its users, including international and national donors, governments through budgetary funding, subsidies and taxes, private sector investment and citizens through microfinance enterprises.

4.2.1

Legal Elements of Attracting International Funding

In **Lusaka, Zambia**, the Water Supply and Sanitation Act, 1997 empowers the national regulator to establish a fund to assist the utilities and communities across the country to extend water supply and sanitation services to the urban poor. The Devolution Trust Fund (DTF) was created under the Act and through the Statutory Instrument No. 65 in 2001. It is a multi-donor basket fund with contributions from the Zambian Government, German KfW Development Bank, Danish International Development Agency (DANIDA), and EU Water Facility.[62] The Zambian Government created the DTF in recognition of the fact that the commercial water utilities, with their focus on full cost recovery, had little incentive for extending services and infrastructure to poorer areas. It funds the installations of kiosks and household connections in poor urban areas. The community has representatives on each project task team which decide on the location of the kiosks. The costs of water from the kiosks is kept low through cross-subsidization by richer water consumers served by the same utility. The DTF can also act as a reward system for strongly performing commercial water utilities. As of May 2011, DTF has financed over 526 projects benefiting more than 826,000 people in poor urban areas.[63]

The Water Services Trust Fund[64] in **Kenya** is a State Corporation established under the Water Act, 2002 and aligned with the 2010 Constitution recognizing the human right to water. It focuses exclusively on poor informal settlements, and aims to eliminate the reliance on informal service providers who charge high tariffs for low-quality water. The Trust Fund's mission is "to provide financial support for improved access to water and sanitation in areas without adequate services". The WSTF's operation is guided by its Trust Deed. The Deed grants the WSTF a broad mandate, beyond the simple provision of funds to include functions to build capacity and raise public awareness on water use and management.[65] The WSTF provides funds to enable licensed Water Service Providers to extend services to the urban poor under the Urban Projects Concept. WSPs are asked to submit project proposals. Financial support is awarded to only the best projects, which are identified through a transparent evaluation with clear cost and social criteria. Water kiosks have been established to sell clean water at affordable prices, as stipulated by the new Kenyan tariff guideline. The guidelines establish that tariffs must be set such that the maximum expenditure on water and sanitation is 5% of household income.[66]

The WSTF builds capacity and awareness by sponsoring Field Monitors who monitor projects and support the WSPs. The WSTF provides a toolkits on various issues to strengthen the capacities of WSPs and enable communities to learn how to manage water projects. The Water Services Regulatory Board requires that utilities set up adequate complaints mechanisms including customer care desks and customer satisfaction surveys. The Board also publishes an annual impact report that focuses on progress towards targets on access, water quality and costs. The Fund also supports MajiData, a pro-poor urban information database that maps slum conditions. The WSTF aims to reach 1.4 million urban poor by the end of 2013 and has attracted a wide range of international assistance due to its clear and stable structure, and early successes.[67]

62 The Devolution Trust Fund Annual Report 2010.
63 National Water Supply and Sanitation Council, "Urban Water Supply and Sanitation", online: <http://www.nwasco.org.zm/urban_water_supply_and_sanitation.php>; UN Best Practices, supra note ??? at 9.
64 Identified as a best practice by the UN Habitat, "The Urban Projects Concept", Database of 2010 Best Practices.
65 Water Services Trust Fund, Kenya, online: <http://www.wstfkenya.org>.
66 UN General Assembly, "Report of the Special Rapporteur on the human right to safe drinking water and sanitation, Catarina de Albuquerque, Addendum, Compilation of Best Practices", UN Doc. A/HRC/182/33/Add.1 (29 June 2011) at 7.
67 *Ibid.*

4..2.2

Legal Elements of Private Sector Participation

The participation of the private sector in water management has met with mixed and fervent reactions. Some believe that private sector participation (PSP) is necessary to attract innovation and financing to address the serious threats of water scarcity, and climate change. Others note that on the ground experience with PSP has often failed to achieve equity in water access, and could lead to irreversible and greater private control over critical water resources. The following jurisdictions have engaged the private sector while achieving social and environmental objectives.

The Water and Sanitation Program reported on a best practice in **Abidjan, Côte d'Ivoire**.[68] The water utility employs a concession contract with a private partner, Société des Eaux de Côte d'Ivoire (SODECI). The strength in this practice is that the government set out a strong water policy and ensured a clear separation of roles for the institutions involved. With its management expertise and financial stability, the city considered SODECI to be well-equipped to implement the pro-poor goals that were clearly established at the outset of the contract negotiation. The contract requires SODECI to implement three pro-poor mechanisms: subsidized household connections, a rising block tariff and licensed water resellers in informal settlements. The household connections are subsidized from a surtax on water bills administered by a public-sector fund. This arrangement provides a long-term, sustainable source of funding. By licensing of resellers in informal settlements allows the government, the city government licenses small-scale resellers in informal settlements. Granting legal status to the resellers allows SODECI to engage with the resellers and regulate the cost and quality of these services even though SODECI is not permitted to work directly in the informal settlements. This best practice exhibits that strong policies or contracts for PSP that impose clear social and environmental obligations can be successfully written and implemented. Clear legal obligations can enable private operators to anticipate the costs of these contract requirements in their bids, and reduces the scope for after the fact renegotiation of contracts.

The experience in **Yerevan, Armenia** provides an example of how state action can be critical to assist a private operator to meet the social objectives set out in their agreements. The private operator signed a management contract with a commitment to address the problem of non-revenue water, with the collection rate at 19% in 2000 at the time of contract signing. Initial progress was relatively slow and stagnated at 47% achieved by 2002. That year, the government issued a decree that allowed the operator to disconnect non-paying customers and passed a law that included provisions for partial forgiveness of customer debts in return for individual meter installation.[69] This reportedly encouraged households to install meters and negotiate partial repayment of arrears. Meanwhile, the private operator focused on improving service continuity. Education campaigns and infrastructure repairs were also conducted. By 2005, the collection ratio was 80%, a significant increase from just five years prior. This experience illustrates the government and industry each offer different areas of expertise, and often a coordinated partnership may be required to achieve desired results.

The **Hubli-Dharwad** privatization project in **India** incorporates three pro-poor aspects: pro-poor policy, public stand posts and tariffs.[70] The pro-poor policy simplifies procedures, waives connection fees (but not the cost of metering), and fixes a lifeline supply of 8,000 litres per household per month at a subsidized rate. Further, the policy contains a provision that requires water to be provided free of charge through public kiosks, cisterns, or borewells for vulnerable populations.

The Municipal Department of Water and Sewerage (Departamento Municipal de Água e Esgotos (DMAE)) in **Porto Alegre, Brazil**, is a public autonomous utility created in 1961. The guiding policy dictates that the DMAE must reinvest all annual revenues into the system. At least a quarter of each commercial utility's profits must be invested into infrastructure to ensure the continued viability of the water distribution system to serve a rapidly growing population. In return, the Government grants the utility tax-exempt status.

68 This best practice summary has been extracted from Water and Sanitation Program, "Urban Water Supply Innovations in Côte d'Ivoire: How Cross-Subsidies Help the Poor" (August 2002).

69 Philippe Marin, "Public-Private Partnerships for Urban Water Utilities: A Review of Experiences in Developing Countries", World Bank Group (2009) at 95.

70 The Hubli-Dharwad project was identified thanks to Ms. Roopa Madhav, an Independent Law Researcher based in Bangalore, India. For a critical analysis of the project see Priya Sangameswaran, Roopa Madhav, Clifton D'Rozario, "24/7, 'Privatisation' and Water Reform: Insights from Hubli-Dharwad", *Economic & Political Weekly* (April 5, 2008) at p. 65.

Opposition to privatisation of water has grown as communities and civil society organizations call for a refocus towards increased public investment, participatory governance, and hydrological approaches to water management that acknowledge limits to water extraction due to ecosystem needs. A major theme for debate is the reconciliation of the conflict between the concepts of water as a human right and water as an economic good. This is relevant in the light of literature arguing that PSP does not give any significant advantage over traditional public approach.[71]

Ultimately, the behaviour of private entities will be defined by the terms of the contract and/or legal framework, and the responsibility remains with the government to specify proper terms and conditions in the project contract or legal framework. Both public and private utilities could better meet the water needs of low-income areas by improving their accountability, transparency, and responsiveness to user demands.[72]

4.2.3

Legal Elements of Small-Scale Service Providers

Local, small-scale private operators have been increasingly participating in water delivery with success, providing evidence indicating that privatization initiatives do not need to focus on large-scale experienced companies. Local private operators can provide advantages of knowledge and direct links to the local needs and culture. They can form partnerships with more experienced entities to gain the technical know-how if lacking. Currently, many local private water providers operate illegally in the low-income areas of mega-cities, providing low quality water at exorbitant rates. When governments provide a stable and legal framework for water delivery by small-scale water providers (SSWP) and other water microenterprises based in the community, they can fill the gaps in service to the poor left by government utilities and the private sector, while meeting affordability and quality standards.

In **Cebu, Philippines**, the water utility has achieved access to water for only 30% of its 1.5 million people, and thus has engaged private entrepreneurs to assist in water distribution.[73] The system is based on small distribution networks connected to privately owned and maintained wells serving up to 500 households. The private operators offer simple connection arrangements and localized service. Although the water tariff is higher than that charged by the water utility, it is significantly lower than that charged by the illegal operators that used to operate in these unconnected, poorer areas.

In **Ho Chi Minh City, Vietnam** about 19% of its 6.6 million people are serviced by SSWPs, in a city where only 44% have piped connections.[74] The SSWPs consist of resellers who sell water from their household utility connection to others in the neighborhood, water tankers who purchase water from the utility, and small entrepreneurs who have built small piped networks. In 2001, the city developed legislation and a program to "socialize" investment into SSWPs.[75] A committee of government and community representatives selects areas for SSWP service and issue requests for tenders from entrepreneurs. Successful bidders must implement the SSWP service to the same technical standards as the utility and in return receive 5-year tax exemptions and logistical support from the State. What is unique about the Ho Chi Minh City case is the real partnership and spirit of partnership created between the water utility and SSWPs.

71 See for example, Naren Prasad, Privatisation Results: Private Sector Participation in Water Services After 15 Years, 24(6) Development Policy Review 669.

72 Water Aid, 'Social accountability: Tools and mechanisms for improved urban water services", Discussion Paper (June 2010).

73 Arthur C. McIntosh, "Asian Water Supplies: Reaching the Urban Poor", Asian Development Bank and International Water Association (2003) at Chapter 7.

74 *Ibid.*

75 Simon Unwin, "The Real Trickle-Down Effect: Improving the role of small-scale water providers in the Asia-Pacific."

4.3
LEGAL ASPECTS OF INNOVATIVE MANAGEMENT TOOLS

Specific management tools are required to put into reality the principles and objectives set out in the governance frameworks. Each mechanism will be designed to achieve specific objectives in accordance with the priorities and urgencies of each mega-city.

4.3.1

Legal Elements of the Human Right to Water

South Africa enshrined the human right to water in its Constitution in 1996, which also decentralised water services to local governments. The 1997 Water Services Act set out a framework to define the content of this right in the South African context. The Act created the concept of the "basic water supply" and established that the amount would be prescribed in regulations. In June 2001, tariff regulations were passed in **Johannesburg** to establish the provision, free of charge, of a basic minimum quantity of water set at 6,000 litres per household per month. This amount was calculated based on an assumption of 6 persons per household with a basic water supply of 25 litres per person per day. In the Mazibuko v. City of Johannesburg case, poor urban residents challenged this amount as too low for those living in large households or sharing a water outlet. The applicants also challenged the installation of prepayment water meters as unlawful. The Constitutional Court ultimately ruled against the applicants; nonetheless the municipality implemented a new policy to increase the free water amount to households registered as indigent.[76] This best practice illustrates that the content of the human right to water can be developed subject to local realities through dialogue between government and citizens.

In 2004, a citizen's campaign in **Uruguay** resulted in the people voting in a national referendum to amend the Constitution to declare water as a human right. The constitutional Amendment made specific pronouncements about the content of the right. Private provision of water delivery and sanitation is illegal, only state entities can provide water. Water resources must be managed sustainably through water conservation and the prevention of contamination. The Constitution also mandates participatory governance in all aspects of water management, limits water exports by both government and corporations, and prioritizes water for human consumption over all other uses. The establishment of the right creates a legal tool for citizens to make claims in national courts. However, the right has been criticized as lacking enforcement mechanisms. In the year following the referendum, the Uruguayan Government passed an executive resolution stating that all private contracts signed before the referendum would be allowed to continue. This experience indicates that the constitutional right to water may not affect rights and obligations already set out in international investments treaties.[77]

While the following jurisdictions have not established a human right to water, they implement similar initiatives aimed at securing a basic minimum level of water supply to their citizens. In **Porto Alegre, Brazil**, the public water utility employs cross-subsidization, offering a "social charge" to low-income households which allows them a discounted rate of the first 10 m^3 consumed daily while tariffs rise sharply for consumption above 20 m^3. The **Phnom Penh** Water Supply Authority, identified as one of the most successful water utilities in Asia[78], implemented a 'Water for the Poor' programme. Low-income households were given subsidized tariffs and connection fees. Fees could be paid in installments. WaterAid notes that effective awareness campaigns were critical to attain buy-in by the people, reducing illegal connections and allowing gradual increases in tariffs. This exhibits the importance of early stakeholder buy-in for cost-recovery measures applied to the urban poor.

76 Johannesburg Report, 2011.

77 Our Water Commons "Case 2: Legal Efforts to Guarantee the Right to Water in Latin America", online: <http://ourwatercommons.org/water-solutions/case-2-legal-efforts-guarantee-right-water-latin-america>.

78 *Supra* note 48 at p. 8.

4.3.2

Legal Elements of Surface and Groundwater Conservation

In the face of water scarcity, the protection and efficient use of the existing water sources is a priority. The legal and institutional mechanisms described in this section are aimed at assuring the safety of drinking water including preventing pollution of source waters, selective water harvesting, controlled storage, and treatment prior to distribution and treatment during distribution.

An innovative, first of its kind scheme to improve water flowing to cities has been implemented in the **Naivasha Basin, Kenya**. The scheme is administered through a legal contract for Payment of Environmental Services (PES) between Water Resource Users Associations (WRUAs) constituted with both buyers and sellers of water resources. Under the PES scheme, downstream populations contract with upstream landowners who undertake conservation measures to reduce silt load in rivers and thus, secure the availability of clean water to the downstream users. The upstream landowners establish plants, terrace along steep slopes, and reduce chemical use in an effort that improves freshwater quality and quantity while also improving livelihoods.[79]

The 1997 National Water Law, No. 9433 in **Brazil** established the principle of water as a limited public good with economic value and created new local Watershed Committees. Under this principle, the Brazilian National Water Agency (NWA) implemented the Water and Forest Producers Program in **São Paulo**. The **São Paulo, Brazil** water supply is protected through two PES schemes at the municipal and national levels, respectively. Brazilian water utilities had noted increases in water treatment costs due to soil erosion and nutrient runoff from upstream agricultural areas. Rather than paying for additional costly treatment plants, the NWA decided to pay upstream farmers to conserve and restore forests on agricultural land upstream of these cities. Healthy forests absorb rainfall and gradually release the water to downstream areas. They also protect the riparian areas of watercourses, and maintain water quality through natural filtration. Meanwhile, agricultural fields absorb less water leading to erosion and flooding, and leach fertilizers thus lowering water quality.

The payments are funded by fees levied by the local Watershed Committee on water-dependent industries and other water users, along with international and NGO assistance. Farmers receive payments per acre conserved or restored, depending on the location of the land, quality of existing forests and amount of revenue sacrificed.

The city of **Extrema** lies upstream of São Paulo, and together with three other municipalities provides two-thirds of the water supply for mega-city. In 2005, the Extrema government enacted a municipal law creating the Water Stewards Project (Projeto Conservador das Águas). The law authorizes the municipality to use its own funds to pay farmers who voluntarily commit to conserve, reforest and improve their land. A regulation was passed in 2006 to provide guidelines on practical implementation of the program. The municipality, represented by the mayor, signed 4-year contracts with 100 private landowners as of 2011.[80] The terms of the contract are individually-defined based on the environmental state of the land. Payments are withdrawn if a farmer fails to comply with the contract terms. Each landowner is required to register their land in the Legal Reserve, which guarantees the land's protection after the contract has expired. The payments to farmers averaged US $87 per hectare per year in 2009 and has resulted in the restoration of 438 hectares by 2011. The pioneering character of the program attracted a broad range of funding partners, from civil society, and all levels of government. The municipality also signs contracts with private companies that pay either the municipality or the farmers themselves for participation in the program. The Extrema municipal government is planning to expand the project to generate carbon credits that can be sold on the international voluntary carbon market and act as a source of revenue for the program.[81]

In **São Paulo**, the Program is predicted to generate US $75 million by 2011 and water prices remain reasonable. Brazil's biggest states and national congress are considering passing legislation to regulate such payments,[82] and the scheme has been expanded to areas upstream of **Rio de Janeiro and Brasilia**.

79 WWF 2011, *supra* note 87 at p 67.

80 Branka Buric, Jean Gault, Francois Bertoye (2011). *Payment for Environmental Services: First Global Inventory of Schemes Provisioning Water for Cities*, FAO Natural Resources Management and Environment Department – Land and Water Division [FAO PES] at pp. 19.

81 Greiber, Thomas (Ed) (2009). Payments for Ecosystem Services. Legal and Institutional Frameworks. IUCN, Gland, Switzerland at p. 100, 115-118. FAO PES ibid at pp. 18-20.

82 The Nature Conservancy, "Rivers and Lakes: Restoring Riparian Zones in the Altantic Forest" online: http://www.nature.org/ourinitiatives/habitats/riverslakes/explore/restoring-riparian-zones-in-the-atlantic-forest.xml; National Geographic News, "Brazil water protection a $100 Million Market?" in International Reporting Project (June 4, 2010), online: <http://www.internationalreportingproject.org/ stories/detail/1563/>.

The National Water Agency in **Brazil** also administers the PRODES program (Programa Despoluição de Bacias Hidrográficas) which links payment to the volume of wastewater treated. The Brazilian federal government offers subsidies to wastewater treatment plants that discharge wastewater that meets certified norms. Up to 50% of the plants investments costs can be reimbursed over four to seven years through the program.[83]

Water reserves have been created in **Mexico** to comply with the provisions of the National Water Law to determine environmental flows.[84] The government developed standards for determining environmental flows that comply with the provisions of the National Water Law. The standard calculates and allocates the water needs of ecosystems in all basins and aquifers across Mexico. Based on this calculation, 189 watersheds were established as water reserves of high hydrological importance. The reserves offer value by increasing Mexico's resiliency to climate change by establishing areas for adaptation measures and to drought periods by establishing a 40-60% buffer capacity of annual water availability. The program establishing the water reserves involves multi-stakeholder participation, with governments integrating ecosystem criteria into water management decisions and citizens participating in the adoption and monitoring of reserves.

In **Kenya** the water regulatory authority implemented guidelines to help protect aquifers and groundwater abstraction. The guidelines include maximum pump motor size, density of existing boreholes and potential for deeper aquifers when new permits are granted.[85]

Other jurisdictions have employed water quality regulations to protect water quality both upstream and within urban areas by reducing pesticide use, implementing rainwater harvesting, restricting wasteful water uses, and establishing a hierarchy of priority water uses.

4.3.3

Legal Elements of Water Re-use

Mega-cities are shifting to a focus on demand-side management in recognition of the need for more efficient and sustainable water use in urban areas with water footprints that commonly reach beyond geographic borders.

An innovative solution is the reuse and recycling of wastewater. Reused, recycled or reclaimed water is defined as water that is used more than one time before it passes back into the natural water cycle.[86] Recycled water is wastewater treated and used for beneficial purposes, such as agricultural and landscape irrigation, industrial processes or groundwater recharge. The practice of using recycled water has a dual beneficial impact: it reduces demand on other sources and minimizes pollutant discharges into freshwater.[87]

The Municipality of **São Paulo** issued regulations mandating water reuse to address its growing water scarcity. The regulations restricted industrial use of potable water and mandated the use of reused water for the washing of streets, sidewalks and plazas and irrigating parks, gardens and sports fields. This regulation prompted the development of the Aquapolo Ambiental Wastewater Reuse Project.[88] Aquapolo is the largest water reuse project in the Southern Hemisphere and the fifth largest in the world. The facility is designed to produce enough industrial reuse water to free up enough drinking water to continuously supply a population of 350,000 inhabitants with the potential capacity to reach 600,000.[89] The project design and operation is managed by a new specific-purpose partnership (SPP) between an environmental engineering firm (Foz do Brasil, the engineering division of Odebrecht Group – 51%) and Sabesp, the state-owned water utility in São Paulo (49%).

Peru has implemented enabling legislation to encourage the recycling and reuse of water. The 2009 Peruvian Water Law authorizes the reuse of treated wastewater to be managed through the Watershed Council. The Regulations of the Water Resources Act 2010 (Decreto 001-2010-AG Aprueban Regla-

83 Raymundo Garrido (2006). "Institutional Aspects of Water Quality Management in Brazil", *Water Resources Development and Management*. 95-106.

84 Eugenio Barrios, "Ecosystem services in the adaptive management of water resources" in Solutions from the Regional Policy Dialog on Water and Climate Change Adaptation in the Americas (2012) at p. 28.

85 WWF 2011, supra note 87.

86 WateReuse Foundation, "National Database of Water Reuse Facilities Summary Report" (2008) online: <http://www.watereuse.org/sites/default/files/s/docs/02-004-01.pdf>.

87 *Ibid.*

88 Short listed for best water-reuse project of the year by the Global Water Awards by Global Water Intelligence, a monthly newsletter with contributions from a network of specialist water and financial journalists.

89 Koch Membrane Systems, "Water Reuse Case Study: Aquapolog Ambiental Wastewater Reuse Project"

mento de la Ley N. 29338, Ley de RecursosHidricos) gives the Peruvian National Water Authority the responsibility to authorize the reuse of treated wastewater as long as it maintains quality criteria and has environmental certification from the correct authority.

Further in 2010, the **Peruvian** Ministry of Housing, Building and Sanitation enacted guidelines through Ministerial Resolution 176-2010-Vivienda for the reuse of treated wastewater to assist in greening urban and surrounding areas. Such reuse must meet the National Sanitation Plan. The guidelines include the following objectives relating to water reuse: improving national management of water resources by reusing municipal and domestic wastewater for irrigating urban areas; and promoting water treatment technologies that will help in reusing domestic and municipal wastewater, and promoting research to improve sanitation and cost-effectiveness.

The National Program for Efficient Use of Water in **Mexico** (1984) includes wastewater discharge regulations by the Federal District. Provisions were established in 1990 for industrial pre-treatment programs. As part of the Water Sustainability Program for the **Valley of Mexico**, there are currently six wastewater treatment plants under construction.[90] The largest plant in Atotonilco, Hidalgo, will treat 60% of wastewater from the Valley of Mexico, while attaining a 50% advance in terms of the target Millennium Development Goals for sanitation. It is expected to directly benefit 700,000 Mexicans and bring an additional 95,000 hectares of arable land into production.[91] The Program for the Sanitation of the Valley of Mexico is an example of a wastewater treatment project for the metropolitan zone of Mexico City, with a total capacity of 74.5 m3/sec. Its objectives are to rehabilitate the drainage system of the metropolitan zone of Mexico City, control industrial waste, improve public health and environmental education and strengthen water systems.[92] The project is financed by the Japan Bank for International Cooperation (JBIC), the Inter-American Development Bank and the Government of Mexico. The project includes the construction of a 15.5 km long tunnel, the construction of the TexcocoNorte Pump Station, the construction of four wastewater treatment plants at TexcocoNorte, Coyotepec, El Salto and Nextlalpan, and additional collections and pump stations.

Mexico's National Water Law of 1992 and its associated regulations regulate the use of the nation's water and right to discharge wastewater, via concessions from the Federal Executive Branch. Such concessions are valid for 5 to 50 year periods. The rules impose sanctions for wasting water, which assists in ensuring that water use is efficient. The Federal Executive also has the power to use concessions in a flexible manner that help in protecting national interests, for instance, if there is a drought, to help restore the ecosystem, to stop groundwater being overdrawn and to prevent contamination.

4.3.4

Legal Elements of Water Markets

With its 1981 Water Code, **Chile** established secure, transferable water rights in line with the market-based focus of its national development strategy. The Code allows individuals to buy or lease water in water markets in a manner similar to real estate. The Code does not mandate a market in water rights but sets up the legal preconditions for such a market to emerge on its own. This mechanism has increased the role of the individual in water management, while decreasing the state's role. Water rights can now be freely bought, sold, mortgaged and transferred like any other piece of real estate, but remains separate from land. The National Water Directorate (DGA, Direccion General de Agua) was responsible for allocating the original water use rights by granting requests free of charge, permanently and without limit whenever the water is physically or legally available. Auctions were used when two or more requests were made for the same quantity of water with sale to the highest bidder. Rights-holders do not pay taxes or fees either for acquiring the rights or for keeping them over time.

90 Government of Mexico, pamphlet for the "Valley of Mexico Water Resources Sustainability Program", online: <http://www.d4wcc.org.mx/images/documentos/folletos/programa_sustentabilidad_hidrica_vm_ingles.pdf>.

91 *Ibid.*

92 Inter-American Development Bank, ME0179: Sanitation of the Valley of Mexico, online: <http://www.iadb.org/en/projects/project,1303.html?id=ME0179>.

The main successes of the Code are that the legal security of private water rights encouraged investment in water use, and the water market has resulted in the allocation of water resources to higher value uses. However the lack of restrictions and conditions resulted in hoarding of water rights for speculation and preventing market competition.[93] A Water Code Reform was passed in 2005 that increased the Government's role in regulating water rights to meet social and environmental objectives in the public interest, created a "fee for non use" of water rights and limiting requests to genuine needs.[94] However, the security and rigidity of the Chilean system is also criticized as its downfall. Critics argue that the Code and its 2005 Reform focuses too narrowly on allocating water to beneficial uses thus failing to adequately take an integrated approach to water management and ultimately sacrificing important social and environmental values.[95]

93 Nirmal Mohanty, Shreekant Gupta, "Breaking the Gridlock in Water Reforms through Water Markets: International Experience and Implementation Issues for India" (2002).
94 Global Water Partnership, "Water and sustainable development: Lessons from Chile" (2006).
95 Carl J. Bauer, "The Experience of Chilean Water Markets", paper presented at the Expo Zaragoza (2008).

4.3.5

Legal Elements of Corporate Disclosure

The private sector impacts water resources, both directly through involvement in water management and indirectly through production of goods and services and along supply chains. There is a growing awareness that businesses have a responsibility to make water resources management a priority and to work with governments and other stakeholders to address this global water challenge.[96] Several initiatives have been put in place to promote transparency and help ensure accountability to advance good practices in water reporting in the private sector.[97]

This section presents legal initiatives to promote the public reporting of water uses and the role of corporate actors. Such disclosure is key to strengthen communication with stakeholders, enhance accountability to the public and provide essential data necessary for the design of sustainable water management plans. This data also benefits corporations themselves by identifying business risks and opportunities.

Water management in **Mexico** is undertaken by the National Water Commission (CONAGUA, Comisión Nacional del Agua) and its activities are recorded in the public registry of water deeds (REPDA, Registro Público de Derechos de Agua). The registry makes information publicly accessible on all water concessions, permits and authorizations granted in accordance to the Federal Law of Transparency and Access to Public Government Information (Ley Federal de Transparencia y Acceso a la Información Pública Gubernamental). This goes towards promoting transparency, although critics have noticed that the information is not always reliable.[98] The registry includes information on absolute or normalized water use data, reporting against targets and verification, and promotion of transparency and public accountability.[99]

96 Pacific Institute, Water Disclosure 2.0: Assessment of Current and Emerging Practice in Corporate Water Reporting (March 2009) prepared for the CEO Water Mandate and UN Global Compact online: <http://www.unglobalcompact.org/docs/news_events/9.1_news_archives/2009_03_11/Water_Disclosure.pdf>.
97 *Ibid.*
98 Héctor Garduño, "Lessons from Implementing Water Rights in Mexico" in *Water Rights Reform: Lessons for Institutional Design*, edited by Bryan Randolph Bruns, Claudia Ringler and Ruth Meinzen-Dick, (Washington: International Food Policy Research Institute, 2005).
99 *Supra* note 70.

4.3.6

Legal Practices that Support Water Efficiency Interventions

The Clean Water Act Law of the Philippines (CWA)[100] is an interesting example of a framework that uses incentives to encourage local governments, water districts communities and the private sector to collaborate in reducing water pollution. As in other countries, there is considerable competition in the Philippines on the various uses of limited waters; in addition much of the generated sewage is not treated and there is considerable extraction of groundwater by users without permits. The CWA's intent is to protect water bodies from pollution from land-based pollutant sources (industries and commercial establishments, agriculture and community/household activities).[101] The Clean Water Act encourages efforts to be made to address wastewater treatment, cleaner production, and technologies that minimize waste. Incentives specifically mentioned in the law are tax and duty exemption on imported capital equipment and tax credits on domestic capital equipment. The CWA also provides for a comprehensive multi-sectoral and participatory approach with explicit intergovernmental coordination including the Bureau of Investments (BOI), the Department of Finance, and the Bureau of Internal Revenue Service. Importantly, the CWA calls for a strong cooperation among different players, requiring the Department of Public Works and Highways (DPWH), Metropolitan Waterworks and Sewage (MWSS) and its concessionaires to implement sewerage program for Metro Manila and connect all to a sewerage system. Local government units and water districts are also covered by this Act and as such must also establish their own sewerage/seepage management systems.

A second example is in **Brazil**.[102] Brazil's 1997 Law on Water Resources (Law 9433), recognizes water as a public good, as well as a limited natural resource with economic value, and it gives priority to human consumption in cases of water scarcity. It also assures the participation of multiple stakeholders in water resources management and seeks to balance current water availability with the needs of future generations by licensing and charging for industrial and agricultural water uses. As a result of this participatory approach to the development of a water and sanitation framework, Federal Law 11,445 of 2007 establishes a rights-based approach to water and sanitation.[103] Some of its principles include universal access to services; transparency; public health and environmental preservation; public participation; safety, quality and regularity of services; the use of cross-subsidies policies; the development of national and local plans of action; and the creation of regulatory bodies when services are provided by third-parties. In 2007, the São Paulo state government passed Complementary Law 1,025 that established a State Council for Water Supply and Sanitation (CONESAN) to coordinate water management efforts made by state government, and the Sanitation Regulation Agency ARSESP. Those entities worked with SABESP, the state water utility, and municipalities to achieve the main goals of the Water Resource State Plan. The law was intended to strengthen the State's regulatory and enforcement role, integrate planning and implementation activities, and promote collaboration between the state, municipalities and civil society via Basins Committees (with representatives of State Government, Municipalities, and civil society), public hearings and public consultation. Under the auspices of these laws, Sao Paulo was able to implement a program to reduce water losses by SABESP, the state owned utility that provides water and sewage services.

100 Philippine Clean Water Act (RA 9275) was enacted on March , 2004 and published on April 21 ,2004 and subsequently took effect on May 6, 2004. Implementing Rules and Regulations of the PCWA of 2004 was approved the Secretary on May 16, 2005 and published May 26, 2005 under DAO 2005-10 series of 2005.

101 See Asian Environment and Compliance Network Briefing Note, "*The Clean Water Act Law of the Philippines: The Use of Incentives to Promote Investments,*"(2010) available at: http://www.aecen.org/good-practices/clean-water-act-law-philippines-use-incentives-promote-investments.

102 See Case Study Brazil, the Rights to Water and Sanitation available at: http: http://www.righttowater.info/progress-so-far/country-cases-of-participatory-approaches-to-legislation-and-policy-review/.

103 Submission prepared by Centre on Housing Rights and Evictions (COHRE) For United Nations Committee on Economic, Social and Cultural Rights Concerning Brazil (2008).

4.4
LEGAL ASPECTS OF RESILIENCY TO CLIMATE CHANGE

Climate change adaption and mitigation efforts are critical to achieving sustainable water management. The impacts of climate change on urban water supplies are likely to be dramatic, with water scarcity expected to worsen, particularly in drier regions of the world.[104] Climate change may stress water supplies due to higher temperatures, prolonged and more extreme droughts and floods, and changes in groundwater recharge, rainfall patterns and stream flow regimes. Climate change can also trigger increased rural-urban migration due to loss of suitable agricultural lands. Institutions can play a significant role in helping urban areas adapt and mitigate the negative consequences of climate change.

Box 4: Eight Elements to freshwater climate adaptation

Source: World Wildlife Fund (John H. Matthews, Tom Le Quesnes), "Adapting Water Management: A primer on coping with climate change" WWF Water Security Report (March 2009).

- develop institutional capacity;
- create flexible allocation systems and agreements;
- reduce external non-climate pressures;
- help human communities and economies move ranges;
- consider water infrastructure development and management carefully;
- institute sustainable flood management policies;
- support climate-aware government and development planning; and
- improve monitoring and response capacity.

In **Lima, Peru**, concerns of sanitation concerns are paramount. The project "Sustainable Water and Wastewater Management in Urban Growth Centers Coping with Climate Change – Concepts for Lima Metropolitana (LiWa)" aims at sustainable planning and improved water management and sanitation in Lima. The project seeks to focus on the impacts of climate change on energy efficiency in water and sanitation systems by modelling and simulating the entire water supply and sanitation system in Lima. It develops and evaluates options for redesigning the water tariff system to meet economic and social requirement, and aims to improve water balance and supply.

The **Lusaka** City Council, empowered by the Water Act, 2002, implements land management activities to reduce severity of floods; improve drainage systems in Kanyama and employ a workforce to maintain and clean the drains; subsidize tankers and provide free removal of waste, improve solid waste disposal options; and construct a deeper and wider main drain in Kanyama to accommodate the expected increase in flood water.

In **Mexico**, the Federal Executive also has the power to use concessions in a flexible manner that help in protecting national interests, for instance, if there is a drought, to help restore the ecosystem. In **India**, the National Water Mission calls for the introduction and implementation of water laws such as to establish an independent water regulatory authority and groundwater regulation as key strategies to meet climate change challenges.[105]

The 2009 **Istanbul Water Consensus** is a commitment by cities and regions around the world to advance integrated water resources management and share best practices to strengthen resilience in the face of the global challenges of water scarcity and climate change. The Consensus recognizes the indispensable role of local and regional governments in improving water access and implementing adaptation measures in the water sector and notes that the improvement of legal frameworks for water management is a core concern for all countries.

104 UNFPA 2007, supra note 2 at 59.

105 Interview with Mr. Sujith Koonan, Researcher, International Environment Law Resource Centre.

4.5
LEGAL ASPECTS OF THE WATER REFORM PROCESS

The process of reforming water management laws and institutions itself is a critical component of designing a sustainable system of water management. As noted in the Dublin Principles, participatory processes, with the involvement of women and the urban poor, are critical in integrated water resource management.

Both **Kenya** and **South Africa** undertook multi-year, multi-stakeholder and cross-sectoral paths to reform their water laws and institutions. In Kenya, the process lasted nearly two and a half years with multiple sectors within government widely consulted such that multiple agencies acted as lead agents for the new law when proposed. Further, consultations were held at provincial and district level, with water user associations to engage a broad array of stakeholder from 2000-2002.[106] South African undertook the reform process at a sensitive political period, and thus legislation and policy development had to be an open and consultative process. The review process began in 1994 with the distribution of a publication informing citizens about their water rights and calling for a public response. The comments from the publication, as well as at the public consultation sessions were used to guide the drafting of a new water law which was also released for public consultation.

The implementation of the Water Steward Programme in **Brazil** took over two years of negotiating with local communities to convince them that the PES scheme would bring benefits to the entire population. Project developers treated the community engagement phase with great care to ensure the approval and participation of local residents in the programme. The developers frequently discussed the project in the city council meetings. When the project became law, it came to be regulated by the Environmental Council of Extrema.[107] The Programme is an example of the role of investment in the capacity for local government to meet environmental goals. This process, from the initial engagement of the municipality in river management issues to the first payments, took more than a decade (1996 to 2007). Between 1996 and 1998 the municipality participated in a project with the Ministry of Environment aimed at fostering decentralized river basin management. Realizing that successful management measures were not possible in the context of a lack of information about its water resources, Extrema launched the project Water is Life (Água é Vida). This project, financed by the Ministry of Environment and Extrema's own resources, assessed the sub-basins and was a building block for the Water Conservation Project. A study is currently being carried out to determine the exact costs of the PES scheme because it involves multiple partners who contribute both cash and in-kind contributions. It is estimated that one third of costs are related to the PES itself (including payments, personnel and administration) and that the rest is directed towards implementation of soil conservation measures and reforestation on farms.[108]

106 Susanne Wymann von Dach, "Sector reform in Kenya: First experiences are positive" InfoResources, Berne, Autumn 2007.

107 IUCN PES, *supra* note 80 at 117.

108 FAO PES, *supra* note 79 at 19.

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CONCLUSIONS

Water is a sensitive issue. It sustains life, it fuels economic development, it transverses borders, and now its very supply and continuity is being threatened by climatic forces that obey neither laws nor market forces.

The legal and institutional framework necessary to achieve sustainable water resources management in urban mega-cities will be necessarily comprehensive and specific to the mega-city context. This Compendium of Legal Best Practices for Sustainable Water Management has brought together several examples of legal and institutional reforms undertaken by developing countries and their mega-cities in the goal to achieve sustainable management of their water resources. Through experience, jurisdictions are learning that the management of increasingly scarce water resources will require active engagement of all stakeholders from governments at all levels, private operators and communities, as well as innovation in the management of both the supply and demand of water resources.

Innovative reforms are possible to the enabling institutions and laws, the means of financing and the management tools applies for water management. **Zambia** and **Kenya** have enacted comprehensive national water laws and institutions that define clear roles and responsibilities of actors, establish economic, social and environmental objectives, and effective monitoring and enforcement mechanisms for management of their water resources. Independent, autonomous city water utilities have been established in **Lusaka, Porto Alegre** and **Istanbul**, allowing these utilities increased freedom to establish innovative delivery initiatives, employee incentives and training, and new partnerships without heavy political influence. **Manila, Chile** and **Yerevan** provide examples of how government can partner with the private sector to improve overall water access.

Pro-poor and environmental objectives have been met through partnerships with local, small-scale entrepreneurs and community water management groups in **Cebu, Ho Chi Minh City, Antananarivo, Lusaka** and **Nairobi**, as well as in the countries of Mexico, Peru, Ecuador, and Kenya. Initiatives towards innovative water service delivery include devolution trusts funds in **Lusaka**, the concept of water as a human right by providing a free basic amount of water to households in **Durban**, community water caregivers in **Manila**, innovative PES contracts for water conservation in Brazil and Mexico, regulations for reuse of treated wastewater in **Peru** and **Mexico**, water markets in **Chile**, and corporate water disclosure requirements in **Peru** and **Mexico**.

Therefore, while the legal and institutional best practices presented here are all works in progress, they are, nevertheless, exemplary of the types of reforms that can be replicated, adapted and improved in new jurisdictions. At its minimum, the Compendium illustrates that courageous jurisdictions are taking concrete steps to the global challenges of water scarcity and climate change, and achieving results.


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