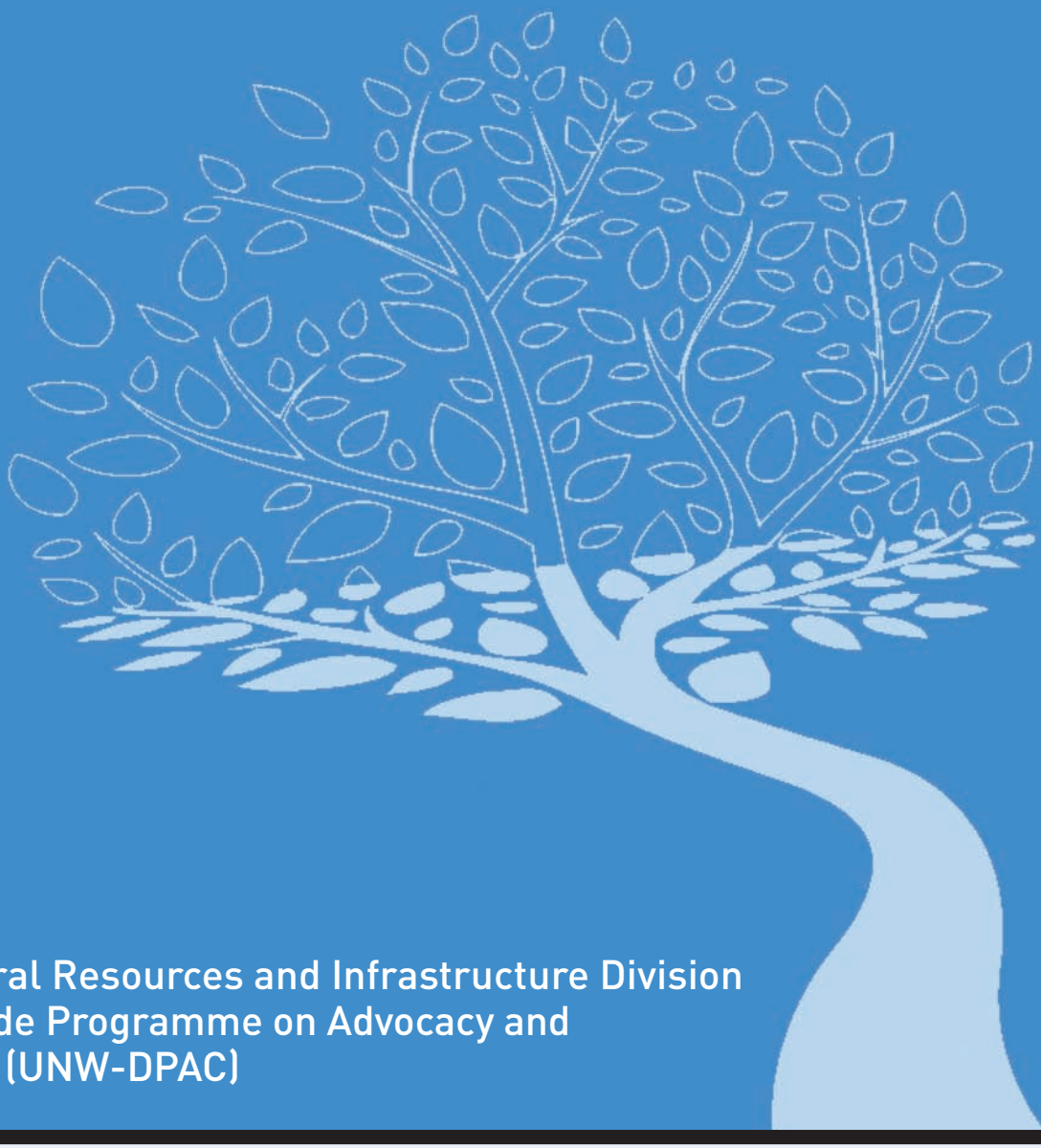
UN WATER

Water and a Green Economy in Latin America and the Caribbean (LAC)



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Content

Abstract

The International Conference "Water in the Green Economy in Practice: Towards Rio +20" took place in Zaragoza, Spain, 3-5 October 2011. The event brought together participants from various regions of the world with the aim to share the practical experiences that have worked and those that need to be adjusted in order to deal with the world's new and emerging problems. Various tools and approaches were presented while experts and practitioners were able to discuss and exchange perspectives on how to improve water governance and, more importantly, to advance the water sector towards the green economy.

The results of this conference, in the form of a best practices guide, are a contribution to the preparatory process for the United Nations Conference on Sustainable Development (UNCSD) which is taking place in Brazil in June 2012 (Rio +20). The Economic Commission for Latin America and the Caribbean (ECLAC) Natural Resources and Infrastructure Division collaborated in the organization of the conference by coordinating the regional session for Latin America and the Caribbean, with the participation of experts from Barbados, Brazil, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Nicaragua, Peru, and other countries. This document is a report of this conference with specific emphasis on the Latin American and Caribbean region.

Water and the Green Economy: expectations for Rio+20

Momentum has been building on water as a priority issue for Rio+20. In the preparatory process, Brazil supported the idea of water being a key emerging issue to be addressed at the conference. Member States, major groups and civil society have become increasingly engaged in making proposals on water as a central theme in Rio. The UN agencies, the Secretariat and UN-Water have provided support and substantive inputs to the process.

Rio is providing an opportunity for assessing progress on international commitments in water. There are three global reports that provide the basis to do so: the 2012 Joint Monitoring Programme Report on access to safe drinking water and sanitation services, the Water Resources Management Report that will be launched at Rio and the March 2012 UN World Water Development Report 4. Internationally, goals in access to water and sanitation services and in water resources management have been agreed in Agenda 21 (1992), MDGs (2000), JPOI (2002), and the Dushanbe Water Appeal (2003).

There is good news in relation to the achievement of the Millennium Development Goals on access to basic safe drinking water services. From 1990 to 2010, 2000 million people have obtained access to improved basic drinking water services. In sanitation, the situation is a major concern since although 1800 million have obtained access to improved sanitation there are still 2500 million people without improved basic sanitation services. The UN-Water global survey of 133 countries on the status in the 'application on integrated approaches to the development, management and use of water resources' will be delivered to Rio+20. Preliminary findings from the survey indicate that most governments have made progress with water sector reforms; but that the implementation process which sees principles turned into policy, laws, strategies and plans is slow.

The poverty agenda, and the concern with equity and planetary boundaries, are very much at the center of Rio preparatory discussions. If there is an issue in which inequities "in the access to water and sanitation services" and the planetary limits "of water resources"

are compelling this is water. Rio represents a unique opportunity not only to assess progress but also to boost commitment from governments and stakeholders to implement actions to address these. Actions that many consider need to focus on how to provide basic services to the bottom billion and on environmental degradation.

The preparatory process for water in Rio has been long, with many proposals ranging from concrete targets for improving efficiency of water use and reducing pollution to improving cooperation, coordination and policy coherence and improving water resources allocation and management. Not all of these proposals have been incorporated in the negotiated outcome document and there may be still a disconnection in the discussion on water and the green economy. The expectation is that there will be advances in the water agenda on access to basic water and sanitation services, Integrated Water Resources Management and Cooperation. This includes a call for improving efficiency and reduce pollution, improve wastewater treatment, and use of treated wastewater and other non-conventional water resources.

An important landmark in the preparatory process has been the UN-Water conference "Water and the Green Economy in Practice: Towards Rio+20" on 3-5 October 2011 in Zaragoza, Spain, focused on tools for the transition to a green economy. It identified four priority water-related loci where change needs to take place in the transition to a green economy: agriculture, industry, cities and watersheds. Six tools were proposed which can be used to facilitate change and support the transition towards a green economy: (1) economic instruments; (2) green jobs; (3) cost recovery and financing; (4) investments in biodiversity; (5) technology; and (6) water planning. These tools can enable us to 'do more with less', overcome barriers, harness opportunities and change behaviours in order to achieve a green economy.

As stated by the Economic Commission for Latin America and the Caribbean (see section II), *the MDG to reduce by half the proportion of people without access to improved water supply has already been met with few exceptions (Haiti, Dominican Republic and Jamaica). Regarding sanitation, the region will be close to meeting the goal with also few countries potentially missing the target (Haiti, Bolivia, Nicaragua, Saint Lucia, Jamaica, Colombia, Peru and Brazil) (JMP, 2011). However, more than 30 million people still lack access to safe drinking water, while more than 120 million people do not have access to sanitation. In fact, service quality (intermittency, water quality control, etc.) is mediocre and infrastructure is often in poor condition, which is illustrated by high water losses—both commercial and physical— that reach about 40% in the large cities in the region and up to almost 75% in some extreme cases. Coverage in rural areas is much lower and those without drinking water and sanitation services are the most impoverished segments of society. Moreover, over two thirds of sewage is discharged into the nearest water bodies without any treatment causing widespread water pollution problems.*

The results of the contributions to the session on water in a green economy in the LAC Region presented in this publication provide key insights and examples on how implementing water in a green economy depends on context and how to overcome implementation challenges.

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Introduction

The main objective of the Zaragoza Conference was to reflect on the lessons learnt from practical implementation experiences and highlight the importance of the social, economic and political context of each region, to facilitate the transition towards a green economy. The format of the event emphasized the experiences and concrete proposals both in the Latin American and Caribbean countries as well as in other regions of the world.

The specific objectives of the event were twofold:

- To position the water agenda as a key element for advancing towards a green economy.
- To demonstrate how different public policy tools can promote this change towards a green economy, and to illustrate their practical application through specific examples in the different regions of the world.

The conference was organized by the UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC) in collaboration with the Organization for Economic Cooperation and Development (OECD), the International Labour Organization (ILO), the World Bank, the United Nations Environment Programme (UNEP), the UN-Water Decade Programme on Capacity Development (UNW-DPC), the United Nations Economic and Social Commission for Western Asia (ESCWA), the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) and the Ebro River Basin Authority (CHE).

The cases presented at the conference demonstrated how appropriate regulation, investments and financing models for providing drinking water supply and sanitation services equitably, efficiently and sustainably and for managing water resources in an integrated way can contribute to reduce poverty, protect the environment and foster socioeconomic development. The conference also highlighted the importance of institutional strengthening, political commitment, technical capacity development and long-term vi-

sion to address the challenges of the green economy. Other conclusions that came out of the discussions held during the event were:

- Water is the engine for the green economy; it is important to ensure that they stay connected.
- Water technology and innovation must be focal points of development.
- Economic instruments are a key aspect of the green economy platform.
- Constantly increasing economic, social and environmental efficiency must become a basic premise that accompanies the green economy.
- Political commitment and enabling policies are fundamental.

This document compiles the case studies and systematizes discussions that were held at the conference and which focused on Latin America and the Caribbean. The first chapter describes how the green economy concept has evolved and its relevance for the Rio +20 process. It also focuses on four water-related issues (agriculture, industry, cities, and watersheds) where significant changes are needed in order to move towards a green economy. Chapter two sets the regional context and explores some of the challenges that the countries of the region face and need to solve in order to achieve a more sustainable and efficient use of their water resources, and facilitate a transition towards a green economy. It also describes some of the lessons that have been learnt in the region. Chapter three is a brief compilation of case studies that were presented during the conference. These highlight some of the lessons learnt and the economic, environmental and social impacts they have had as a result of their implementation. The last chapter is a compilation of interviews that were prepared specially for this report under the thematic frame of water in the green economy.

I. Mainstreaming water into a green economy[1]

The first United Nations Conference on Sustainable Development (UNCSD) (Rio de Janeiro, 1992) intended to create a shared vision for reconciling economic growth with environmental protection and building a more equitable world. It was then, in what was called the Earth Summit, when sustainable development was officially launched into the mainstream. Twenty years later the governments of the world are meeting again in Rio de Janeiro for the international conference known as Rio +20. However, the world is now facing major and overlapping global crises — the economic and financial crisis, accelerating environmental degradation, water scarcity and pollution, and the emerging impacts of climate change. All these challenges not only hinder socioeconomic development but also impede efforts to eradicate poverty and achieve a more equitable society.

The objectives of the Rio +20 conference are three-fold. First, the event aims to secure renewed political commitment for sustainable development. Second, the conference will be an opportunity to stake stock of the progress made towards previous internationally agreed commitments. Lastly, there will be a special focus on new and emerging challenges. Rio +20 will also focus on two themes: i) how to build a green economy which delivers sustainable development and lifts people out of poverty; and ii) how to improve the institutional framework and international coordination for sustainable development.

The emerging concept of the green economy has shaped much of the discussions in the preparation for Rio +20 and simply put, it is the practical and operational framework that will serve to implement the three pillars of sustainable development (environmental, economic and social). The concept has already served an important purpose: acting as a catalyst and rallying individual, national and international actors to work together towards a common vision.

1 Based on the Conference Book: Water in the Green Economy in Practice: Towards Rio+20.

While it is evident that "business-as-usual" is fraught with the disastrous consequences along the road, articulating the details of a green economy and identifying possible pathways to get there will be a major task for the Rio +20 summit. Furthermore, of critical importance to the success of the conference will be the way in which the needs and concerns of developing countries are addressed. A reoccurring and legitimate concern relates to the provision of support to enable these countries to advance towards a green economy and avoid the mistakes the developed world has made. The capacity of national governments to deal with the adverse impacts of green economy adjustments (such as the loss of jobs in some sectors) vary greatly. There is a need for a strong social component to accompany the transition to a green economy, which considers the impacts of such changes on broader social outcomes such as access to education, health and basic services, particularly drinking water supply and sanitation. There are also concerns about the introduction of new conditionalities that might restrict trade, financing, international investment, and official development assistance.

Water is fundamental to the green economy because it is interwoven with so many sustainable development issues, such as health, energy, food security, and poverty. In developing countries, access to drinking water supply and sanitation services is a fundamental precondition for poverty reduction, economic progress and environmental protection. The multiple benefits of providing access to these services in terms of public health, life expectancy, perspectives for economic development, and the freeing of time for education and economic activities, are well known, as illustrated in recent ECLAC studies of Guatemala and Peru that identify the impacts of providing and improving these services, in order to generate arguments in favour of the government prioritizing the sector both in terms of public policy and budget allocations (Lentini, 2010 and Oblitas de Ruiz, 2010).

Water is the common thread that connects the three critical issues of food, energy and climate change. Sustaining economic growth is only possible if we recognise the limited and fragile capacity of ecosystems to supply the water needed for agriculture, industry, energy generation, human water supply and the production of the many goods and services demanded by society. The green economy implies managing water in a way that catalyses social and economic development, while also safeguarding freshwater ecosystems and the services they provide. Water management must be improved in order to achieve food security, conserve ecosystems and reduce the risks from water scarcity and pollution, natural disasters such as floods and droughts, and from climate change.

Addressing the water challenge requires the creation and strengthening of institutional mechanisms to facilitate integrated water resources management, as well as the transfer and adoption of new technology with emphasis on water conservation, improved irrigation methods, water reuse and efficiency improvements. Many countries have made progress in water sector reforms; but the implementation process which sees principles turned into policy, laws, strategies, plans, institutional capacity and concrete results is very slow. Some countries have difficulty moving beyond the first political or legislative steps and additional support is needed to help countries enhance water governance and achieve universal coverage of drinking water supply and sanitation services.

Making the shift to the green economy requires that all economic sectors work towards accelerating socioeconomic growth, reducing poverty and inequities, while at the same

time aligning these advances with environmental improvement. With regard to water, sustained efforts are needed to address the challenges and harness opportunities in four priority issues that were identified for the Zaragoza Conference: agriculture, industry, cities and watersheds.

A. Agriculture

Agriculture accounts for about 70% of global water withdrawals and four out of ten people around the planet work in the agriculture sector. The challenge is not just about increasing agricultural production to meet the aspirations of a growing population and global economy. While the world currently produces enough food to feed everyone, more than 900 million people go hungry because they cannot afford to pay for it. Paradoxically, economic progress and advances in alternative energy threaten to worsen the situation for the poorest. These developments, if not properly managed, risk to drive up basic food prices, divert resources towards producing more valuable goods such as biofuels and eventually undermine food security and efforts to eradicate poverty in least developed countries. Small-scale farmers often occupy marginal land and depend mainly on rainfall for production. This makes them highly sensitive to climate variability and change, and extreme events such as droughts and floods.

A green economy requires the achievement of food security, but by using less natural resources in a more efficient way. This could be achieved through improved resource efficiency, substantial investments and innovations. It implies increasing crops that ensure a higher efficiency in terms of nutrition per drop of water. The following are some of the approaches within the agricultural sector, highlighted in the Zaragoza Conference for transitioning to the green economy.

- Efficiency of smallholders can be achieved by both push (access to technologies) and pull mechanisms (access to markets).
- Attention to the interdependencies between water, food, energy and climate. There is a need to align plans, strategies and programs dealing with elements of that nexus and recognise potential tradeoffs between land and water use, biodiversity, green house gas emission reduction, etc.
- Ensure that well-functioning markets provide the right signals:
  - Prices that reflect the scarcity value of natural resources as well as the positive and negative environmental externalities of the food and agriculture system, will contribute to resource use efficiency.
  - Provision of incentives for the supply of environmental goods and services.
  - Improvement of irrigation efficiency in agriculture.
  - Promotion of wastewater treatment.

B. Industry

Although the industrial sector only uses about 20% of global freshwater, industrial water use is rising and industry will increasingly be competing for limited water resources with growing urban and agricultural water demands. One of the major challenges for industry today is to effectively address the unsustainable exploitation and contamination of freshwater resources around the world. Many industries use more resources than their production processes require due to the continued reliance on outdated and inefficient technologies and failure to adopt proper management systems. In many countries industrial development goes hand in hand with environmental degradation and resource depletion, which threaten opportunities for sustainable economic growth. But the technologies and expertise do exist to avoid the industrial pollution and environmental deterioration. Industry, as the prime manufacturer of the goods and services that societies consume, has a critical role to play in creating more sustainable production and consumption patterns. In the transition to a green economy, the environmental services sector offers opportunities for industries, as it can assist them in assessing, measuring and managing their environmental impacts, as well as in the management and safe disposal of pollution and waste.

The current economic and financial crises can also provide an opportunity for industries to become more sustainable. The large public spending programs being proposed and implemented as a means to revive economies are an opportunity to place our industrial development on more sustainable pathways of growth. The following are some examples of how industry can become more sustainable:

- Improvements in water use and energy efficiency along the value chain of industrial processes (production, transformation, marketing, consumption, recycling) via government and market incentives and regulations/standards and consumer campaigns.
- Industries should work to convert wastewater streams into useful inputs for other processes, industries and industrial clusters.
- A different price structure for industrial water use which requires industry to pay more per unit of water would promote increased water use efficiency.
- Support for the development of small and medium companies and local green industry in the transition to a water-friendly economy accompanied by promotion of good practices of corporate social responsibility around water.

C. Cities

Half of humanity now lives in cities , and within two decades, nearly 60% of the world's population will be urban dwellers. Cities cannot be sustainable without ensuring reliable access to drinking water supply, sewerage and wastewater treatment. However, existing institutions have shown a limited ability to anticipate and support the expansion of cities with the provision of water services. Although worldwide the proportion of people with access to water and sanitation gradually increases, in 2010 there were more urban dwellers without access to improved water sources (more than 100 million) and basic sanitation (more than 130 million) than in the year 2000.

Slums or informal settlements are often built on unstable slopes, or in other areas of high risk. Natural disasters, such as floods and droughts, form a major challenge for cities, especially for slum areas. The frequency of natural disasters is expected to increase in the future as a result of climate change. Pollution poses another major problem for cities. Urban settlements are the main source of point-source water pollution. In many cities, wastewater infrastructure is almost nonexistent, inadequate or outdated. Water storage, treatment and distribution systems are often poorly maintained resulting in elevated water losses, both technical and commercial, often exceeding 40-60%.

With the majority of the world's economic activity and now over 50% of its population concentrated in urban areas, cities have a central role to play in the transition towards a green economy. How cities develop has far-reaching effects on economies, energy, water and land use and climate change. The transition of cities to a green economy requires a combination of sustainable urban development, protection of urban ecosystems, effective management of wastewater and pollution control, efficient water use and improved governance. The following approaches can contribute to a sustainable urban development:

- Expansion of network infrastructure for drinking water supply, sewerage and stormwater drainage while getting the most out of existing networks.
- Integrated urban water management, including managing the complete urban water cycle, to facilitate the multi-functional nature of urban water services in order to optimise the outcomes of the system as a whole. This involves managing freshwater, human water supply, sewerage, wastewater treatment, wastewater reuse and stormwater linked within the resource management structure, using an urban area as the geographical unit of management.
- Integration of land and water management.
- Wastewater reuse
- Effective regulation for water suppliers and wastewater managers that promotes sustainable water use.
- Practical tariff systems for consumers whose income is low as well as variable.

D. Watersheds

Human well-being depends critically on the health of freshwater ecosystems. This is particularly the case for the world's poor, as they often depend directly on water and other ecosystem services provided by rivers, lakes and wetlands for their livelihoods. Current unsustainable patterns of development and production are leading to overexploitation of aquifers and watersheds, environmental degradation and the loss of inland and coastal wetlands. Protecting freshwater ecosystems requires recognising the special characteristics of water; a change in one part of a river basin necessarily has consequences downstream.

There is a recognised link between poverty alleviation and the benefits that people derive from ecosystem services — especially those provided by freshwater ecosystems. The protection and sustainable management of these ecosystems can therefore play a critical role in poverty reduction strategies, by securing the continued cost-effective delivery of the water, food and other services that the poor rely on. Recognising the valuable, less visible and non-monetised benefits of conserving ecosystems represents an opportunity to recover sustainable economic growth, social equity and poverty reduction paths while improving and protecting the environment. There is already solid evidence that ecosystem based solutions to water-related problems are not only viable but can be very attractive in terms of sustainability and economic efficiency.

One of the key ways that water managers, other stakeholders and those concerned with conserving biodiversity have collaborated is through the use of economic and financial measures that provide incentives for the sustainable management of ecosystems. One of the most widely implemented approaches during the last decade is payments for ecosystem services.

These are some of the examples that can contribute to the preservation of freshwater ecosystems:

- Shift in focus towards a systemic approach to water management which takes into account ecological considerations.
- Management of river basins as integrated systems.
- Integration of land and water management instead of treating them as separate areas.
- Building resilience, adaptiveness, and adaptability, and learning from the past.
- Due to the inherent uncertainty of future climate change projections, water management needs to be flexible, so as to be able to cope under a range of possible futures.
- Water reuse, particularly in peri-urban agriculture.

II. Water and a green economy in Latin America and the Caribbean[2]

The Latin America and the Caribbean region is endowed with around one- third of the world's water resources. However, these resources are unevenly distributed among and within countries. The pattern of water use in the region, given its overall size, can only be described as spatially sporadic and highly concentrated in relatively few areas. Many large urban centres and important economic activities are settled in arid or semi-arid areas and water availability is increasingly reduced by intensive water use and growing pollution. Latin America and the Caribbean is already the world's most urbanized developing region, with more than 80% of the population living in towns and cities (UN, 2012) in many cases in precarious conditions, as the 100 million people still living in slums (ECLAC, 2010).

Water management in Latin America and the Caribbean has evolved over time. Attention has shifted from the construction of large infrastructure projects for irrigation and hydroelectricity generation in the 1950s and 60s to the provision of drinking water supply and sanitation services in the 1970s and 80s, to increasing emphasis on non-structural measures, water conservation, environmental protection and pollution control in the 1990s and 2000s, as the region starts facing challenges of increasing water scarcity, pollution and climate change. The governments of the region have also recognized the importance the water sector can have in creating conditions for economic growth and in the alleviation of poverty. The focus of the governments of the countries of the region is now primarily on fulfilling the Millennium

Development Goals (MDGs) for the reduction of poverty which for water management translates into a concentration on improvements in the provision of drinking water supply and sanitation services, as illustrated for example by the Water for Everyone Programme in Peru (see Box 1).

2 Based on ECLAC contribution to WWAP (2012), soon available as Lee (2012).

BOX 1. "WATER FOR ALL" PROGRAMME IN PERU

In Peru, the Water for All Programme was designed and launched as a political initiative during the 2006 presidential campaign. Although it is still too early to assess the impact of the programme, an ECLAC study analyzes its design and implementation, identifies some of its problem areas and, taking into account the experience gained from its execution so far, proposes some public-policy guidelines for the drinking water and sanitation sector in Peru for the coming years (Garrido-Lecca, 2010).

The study presents the programme not only as a mechanism for expanding the coverage of drinking water supply and sanitation services, but also as an example of what it refers to as a "cost-based approach" to the alleviation of extreme poverty or indigence. After identifying indigence as an exclusion problem separated from the challenge posed by poverty (in the sense that extreme poverty falls outside the market system), State intervention is presented as the only way of tackling it. In addition to conditional cash transfers ("demand-driven approach"), one-off interventions are being proposed to reduce what the study refers to as unavoidable expenses in order to free up family cash flow and increase the income available for satisfying basic needs, and ultimately to generate a small amount of savings and allow the family to transition towards poverty levels that at least involve inclusion in the market.

What is the rationale for the Water for All Programme? Families living in extreme poverty in Lima and Callao these areas consume about 3 cubic metres of water per month (which they buy in drums for 3.7 USD per cubic metre). Each family's water bill therefore totals 11 USD per month. In 2006, families connected to the public water network paid 0.4 USD per cubic metre of water. Therefore, if the families living in extreme poverty were connected to the network and consumed the same amount of water as before they were connected, each family's monthly water bill would, in theory, fall to 1.2 USD.

Of the households (which averaged 5.3 persons) involved in the programme, 70% had an income of between 74 USD and 220 USD. Connecting to the public network led to average savings of 5.8 USD for 56% of those households, with 21% of households saving over 7.4 USD. Of those who were not connected, 63% said they would buy more food with the savings made by connecting to the water network, thus confirming the theory that this would increase disposable income. The main benefit of connection was better hygiene and fewer diseases, according to 89% of those surveyed (that is to say that most of whom were not aware of potential savings); while only 12% pointed to the savings to be made (higher disposable income) as a benefit. Lastly, the households that were not connected consumed an average of 3.2 cubic metres of water per month.

The empirical evidence shows, however, that once connected to the network, families living in extreme poverty went from consuming 3 cubic metres per month to 10 cubic metres per month—more than tripling their water consumption. Despite this, their monthly spending on water still went down from 11 USD per month to only 4 USD per month, representing a monthly saving of approximately 7.4 USD.

If a family's monthly nominal income is 148 USD, an additional 7.4 USD per month as a result of the connection to the public water and sanitation network represents a 5% increase in income. However, if we consider that 50% of nominal income is spent on unavoidable expenses, the increase in disposable income would be 10%.

Unlike traditional programmes that are demand-driven, the Water for All Programme, being a cost-based approach, entails a one-off investment cost of connecting to the public water and sanitation network (not a recurring cost) since the families themselves then pay

for the service with only a small, pre-existing cross subsidy that covers an initial consumption block. Therefore, in terms of sustainability and from a fiscal point of view, the programme requires only a one-off effort, which does not jeopardize its continuity or the beneficiaries chances of escaping from extreme poverty.

The Water for All Programme helps reduce gastrointestinal diseases caused by a lack of basic services and inadequate sanitary conditions, which leads to savings in medical costs, medication, and lost working days, as well as lower costs and a higher nominal income and, therefore, an additional increase in disposable income, which can be used to satisfy (in part) the needs of families living in extreme poverty.

The households in the lowest quintile of the population are estimated to experience an average of four episodes of acute diarrhoeal diseases per year at a total cost of 28 USD per episode (9 USD direct cost to the family and 19 USD cost to the State). Therefore, acute diarrhoeal diseases in households living in extreme poverty result in a loss of disposable family income of 34 USD (8.5 USD x 4). In addition to the direct increase in disposable income generated by the Water for All Programme, the estimated monthly saving from lower health costs will also lead to an indirect increase in disposable income—taking account only of the elimination of the episodes of acute diarrhoeal diseases—of about 4% per month (resulting in a total increase in disposable family income of 14% per month). This is the true impact of the Water for All Programme.

Source: Garrido-Lecca, Hernán (2010) y (2011)

The main issues facing the countries of the region in water resources management have not changed significantly in recent years. There has been a widespread inability to establish formal institutions that are able to deal with water allocation issues and control of extreme events and externalities (water pollution, aquifer depletion, etc.) under conditions of scarcity and conflict. The water sector still exhibits many examples of poor management; when formal norms exist, they are often inadequate to deal with the problems at hand and the operational capacity to implement them tends to be extremely limited; there is a general absence of self-financing and a consequent dependence on fluctuating political support. In general, there is an inability to respond to crises.

Despite much improvement, reliable information is often not available, including on the resource itself, its availability, uses and users, on the infrastructure and on future needs. Poor water management in the region means conflicts over the resource are still persistent and widespread. Issues over water allocation and pollution, and competition amongst sectors —irrigated agriculture, industry, mining, urban water supply, water for environmental protection and indigenous groups— will increase significantly as economic development continues to augment. In 2011 the region grew by 4.3% and although in 2012 its growth rate decreased, it still had a positive trend reaching almost 4% (ECLAC, 2011a). At the same time, Latin America and the Caribbean have the most inequitable income distribution in the world (ECLAC, 2011b). Achievements of universal service coverage, management of water conflicts and resolution of environmental problems are hampered by these inequalities (Box 2).

BOX 2. SOCIAL INEQUALITIES AND ECONOMIC INEFFICIENCY IN TIMES OF CRISIS

The outlook for the global economy remains bleak, with recessions plaguing the developed countries and strong indications of a slowdown in Latin America and the Caribbean following several years of vigorous growth. However, the outlook is not uniform throughout the region as some countries are better positioned than others to deal with the crisis. Regarding those that are ill-prepared, making budget cuts in times of crisis may seem the only feasible option. However, this can have dreadful medium and long-term consequences, for both economic efficiency and social equity.

The immediate consequences include an apparent fiscal relief, a contraction of effective demand (leading to lower tax revenue, and thus feeding into the budgetary downward spiral), likely litigation with contractors (which creates new implicit public debt) and cost increases stemming from work delays. The cancellation of projects directly translates into lower employment for less-skilled workers (although this might allow public sector pensions and employment to be preserved, usually to the benefit of the middle class). Existing capital is consumed and the quality of services declines as capital depreciates. Coverage goals are suspended or delayed. The number of poor continues to increase, because of both natural growth and the very dynamics of the crisis. Regarding immediate consequences, efforts to see that larger segments of society benefit from infrastructure, are set aside until the next economic boom. Social integration becomes, at best, a procyclical policy intensifying the challenge to reduce social inequalities and economic inefficiency.

Source: Ferro and Lentini (2009)

Important efforts have been made to improve drinking water supply and sanitation coverage. At the regional level, the MDG to reduce by half the proportion of people without access to improved water supply has been already met with few exceptions (Haiti, Dominican Republic and Jamaica); regarding sanitation, the region will be close to meeting the goal with also few countries potentially missing the target (Haiti, Bolivia, Nicaragua, Saint Lucia, Jamaica, Colombia, Peru and Brazil) (JMP, 2011). However, service quality (intermittency, water quality control, etc.) is mediocre and infrastructure is often in poor condition, which is illustrated by high water losses—both commercial and physical— that reach about 40% in the large cities in the region and up to almost 75% in some extreme cases. Coverage in rural areas is much lower and those without drinking water and sanitation services are the most impoverished segments of society. More than 30 million people still lack access to safe drinking water, while more than 120 million people do not have access to sanitation. Moreover, over two thirds of sewage is discharged into the nearest water bodies without any treatment causing widespread water pollution problems.

Currently, the region produces 31% of the global supply of bio-fuels and 48% of soybean (Bárcena, 2011). Tendencies show that agricultural production will keep on growing in most of the countries in Latin America resuming the expansion achieved between 2000 and 2007 (ECLAC, FAO and IICA, 2010). Irrigation can play an important role in increasing agricultural yields, however, in many countries the levels of irrigation efficiency range

between 30% and 40% (San Martin, 2002). Expansion of the area under irrigation has shifted over time and an increasing urban population will add pressure to relocate water from the agricultural sector to urban drinking water supply in cities.

Many parts of the region are highly vulnerable to the adverse consequences of climate change, and this could potentially threaten the progress made towards achieving the MDGs. The expected effects of climate change will generate risks, challenges and opportunities to water management. Some of these can be seen in the Andean countries which experience El Niño-Southern Oscillation (ENSO) and in those resulting from the succession of long droughts in the northeast of Brazil (Samaniego, 2009). Moreover, the countries estimated to be in areas of high and extreme risk from climate change are often the poorest countries of the region in Central America, the Caribbean and the Andes. The most serious challenges arising from climate change for water resources management in Latin America and the Caribbean can be expected to lie in the following areas:

- A significant deterioration in the quality, quantity, and availability of water for all uses in many river basins.
- Damage to coastal areas due to a potential rise in sea levels, which in turn will affect river regimes and contribute to saline water intrusion into freshwater aquifers.
- Increased economic damage from the greater intensity and frequency of hurricanes and tropical storms due to higher ocean surface and air temperatures.

A. Challenges

The issues that water management in Latin America and the Caribbean has to confront do not all come from within the water "box". There have always been strong external drivers or forces affecting both water management and the water resource. The more significant of these come from general social change, but also include macroeconomic policies, often a negative influence, stemming from abrupt changes in domestic policies and from outside, such as the rather recent economic crisis, but sometimes positive as macroeconomic administration has improved domestically and globally, as with the expansion of world markets in recent years.

Water resources management often presents problems requiring a holistic approach. Among these the following are significant: coordination of supply and demand policies; policies for the quality and quantity of water resources; the joint use of surface and groundwater; the multiple use of resources and multi-purpose projects; coordinated management of land use, vegetation cover and water; management of externalities; improvements in data collection and information management; and environmental conservation policies. The Specific Water Cabinet created by the Government of Guatemala is an example of how coordinated work amongst various sectors and governmental agencies can improve water governance and help overcome some of the above mentioned management issues.

In Latin America and the Caribbean, institutions are often weak, they lack operational capacity and rules are insufficient or not enforced. Fragile institutional frameworks, corruption and capture, not only in the water sector, but in general, negatively affect water management. The absence of appropriate water management institutions causes uncertainty, deepens conflicts over water and hampers socioeconomic development. Water resources management needs clear rules, objective criteria, strong and efficient government institutions, transparency and a holistic approach which in most of the countries of the region are missing. There has been an effort to transit towards integrated water resource management as a framework that can help overcome these challenges; however, it often remains as a theoretical concept difficult to translate into reality.

Advances have been achieved both at the national level, through the implementation of new water management systems based on new legislation (*Hantke-Domas, 2011*); and at the river basin level with watershed or river basin organizations. However, these efforts have been isolated and had limited success. Over the last two decades, the water supply and sanitation sector has been subject to extensive reforms in the majority of the countries of the region, there have been few success stories, as in many cases, reforms encountered difficulties or went astray due to the lack of consensus, capture by special interest groups, and especially failure to consider the structural limitations of national economies and sound principles of water resources management and economics of service provision. Lack of integrated planning and failure to recognize that water management is a complex issue that requires adequate regulatory capacity, has hindered advances in many countries. Public awareness and stakeholder participation are key to solving conflicts. Not involving communities in decision making process has proved to have explosive effects, as seen in the case of Cochabamba[3], Bolivia. Although the situation in this respect has improved over the years, it is in general still affecting the proper management of water resources in the Latin America and the Caribbean region.

Aging water infrastructure, insufficient investments and inadequate regulatory frameworks are at the heart of the challenges for the provision of drinking water supply and sanitation services. Tariffs should serve as a proper signal to water users, however they often do not reflect even operational and maintenance costs. Some countries, such as Chile, have implemented full cost recovery tariffs supported by subsidy systems for the poor; however this is not the case for most countries of Latin America and the Caribbean. Providers of water and sanitation services find financial sustainability difficult to attain due to high levels of poverty and the fact that decisions, often taken outside the economic realm, set tariffs that are too low. There is a need to bring tariffs to cost recovery levels, but accompanied by significant public investment (political priorities are very important) and creation of effective subsidy systems for the poor.

3 In 1999 a multinational consortium named Aguas del Tunari took the lead in privatizing the water supply and sanitation services in Cochabamba, one of the biggest cities in Bolivia. However, there was limited public participation in the lead up to awarding the concession contract and the water legislation was outdated (Law No. 2029). These, coupled with other irregularities, generated a strong reaction among the public in the form of protests against excessive rate hikes. In 2000 the protests became violent, the contract signed with Aguas del Tunari was terminated and a new water legislation was approved (Law No 2066).

B. Approaches

Some countries have implemented significant reforms. For example, Brazil has adopted a new water legislation and a national water management policy; new water laws have also been recently adopted in Honduras, Nicaragua, Peru, Venezuela, among other cases; Chile has reformed its water law and the water supply and sanitation sector, and privatized all water-related utilities; Mexico reformed its water legislation and created river basin councils.

Economic instruments, such as subsidies, tariffs and charges have been implemented in the region with mixed results. In the countries of the region —which do not have the human and financial resources of developed countries, nor a State or private apparatus with the equivalent organization and management capacity— interest in trying to apply these is not always compatible with the basic conditions they require. Economic instruments have had a relatively limited impact in the region thus far, largely due to the fact that countries lack the adequate institutional structure and regulatory capacity to make full use of them.

Furthermore, good results are generally vetoed by the prevailing conditions of user informality, lack of information, perverseness or ignorance about good practices concerning the use (or rather abuse) of water, in combination with an almost absolute inability to enforce the law even where formal legal conditions exist. Among other basic conditions that are lacking, most of the countries of the region do not have efficiently institutionalized systems of water management. Without this, very little can be done, bearing in mind the enormous fragmentation of institutions and responsibilities involved in water management in most cases. Widespread poverty, lack of trained personnel, insufficient control and monitoring systems, the concentration of economic and social power, the ease with which regulators or managers (where they exist) can fall under undue influence or be captured by special interests, all constitute impediments to the use of economic, or any other, instruments. All this is not to say that economic instruments are not useful for improving the use and management of water resources, particularly at sectoral level. For example, many systems charge for the cost of administering water resources. There are also examples of charges intended to recover costs of water works, pay for water-related services and wastewater treatment, cover administrative expenses and induce water conservation and environmentally sound behaviour[4]. Many countries of the region have already implemented or are implementing systems of charges for water as a resource or for wastewater discharges to the environment.

Improving efficiency helps achieving equity. By providing services efficiently, costs can be reduced allowing the allocation of resources into maintenance and expansion. At the same

4 For example, the Regulatory Authority Act in Costa Rica states that environmental sustainability must be considered when setting public utility rates. It also establishes the obligation for service providers to protect, conserve, restore and make rational use of natural resources utilized. In November 1999, for the first time, the Heredia Public Services Company sought approval for a rate amount that would cover the environmental services provided by the forest to the water resource with a view to protecting the capacity of forest ecosystems to catch water and maintain the water supply and surface flow. Now the resources obtained are used for the environmental service of protection of water resources in groundwater recharge areas.

time, to transition towards a green economy, Latin American and the Caribbean countries will also need to focus on elements such as:

- Water use efficiency, loss reduction and metering.
- Energy efficiency in the provision of drinking water supply and sanitation services.
- Drinking water supply and sanitation in the fight against poverty, for social cohesion and integration and green employment.
- Generation and management of new and unconventional water sources (such as seawater and brackish water desalination, wastewater reuse, market reallocation, watershed management and payments for environmental services) for human supply and other competing uses (especially mining and in some case, export-oriented agriculture).
- Domestic wastewater treatment and recycling, full water cycle management.
- Climate change adaptation and mitigation (as for example methane recovery in wastewater treatment).

C. Lessons learnt[5]

As water is so closely linked to society, economy and the environment, there are no simple or easy answers that guarantee governance. The only possible suggestion is that although governance may be expressed in different organizational systems and its formal content arranged differently (such as laws and institutional arrangements), every society has natural conditions, power groups, power structures, and requirements that must be considered specifically in the process of designing the system. Otherwise, there is a risk of ignoring factors necessary to ensure viability.

Notwithstanding, the management of a resource or its associated public services consistently show certain characteristics. This is clear from the typical characteristics of the legislation governing water and its associated public services. In this respect, some considerations are tentatively presented that, in the light of practical experiences across the region, may be considered to be generally valid.

Water legislation

- Water laws must clearly state that water belongs to the public domain of the State.
- Water laws must determine specifically that water use rights, when granted under conditions of, or which aim at, effective and beneficial use and that do not cause environmental damage, are protected by private property clauses in the constitution.

5 From Solanes and Jouravlev (2006).

- In the case of water rights and uses that were in existence prior to the legislative change, including traditional and indigenous uses, they should be recognized in accordance with their effective and beneficial, historical and current use, without this affecting the possibility of imposing appropriate regulations.

For the regulation of drinking water supply and sanitation services:

- Reasonable tariffs and profits. It is important to bear in mind that privatization does not miraculously make unprofitable operations profitable.
- A subsidy system that avoids as far as practicable cross-subsidies and that guarantees the low-income groups a basic minimum supply.
- The right to adequate and opportune information, both for the regulators and for customers.
- Obligatory uniform regulatory accounting; and control of transfer prices, holdings and intra-holding transactions.

Regarding centralization and decentralization:

- Depending on the activities involved, determine the appropriate level for decentralization or centralization, in accordance with technical considerations and economies of scale and scope.
- Preserve a residual capacity at the central level, to promote or implement the necessary activities or measures in the event of decentralized bodies being negligent or unable to carry out their functions.
- National legislation should recognize the two basic principles that govern disputes between decentralized authorities: (i) equity and reasonableness; and (ii) not causing significant harm

Regarding water management institutions:

- The authority responsible for water allocation and management should be independent from sector influences, with authority and resources in line with its responsibility.
- Inserting water management within environmental agencies may result in minimizing its effect as a socioeconomic development factor.
- Therefore, it seems appropriate that the water resources have their own stable and independent institutions, even when these are closely linked to institutions responsible for the strategic vision of national development.
- Water-related decision-making has economic content, and special interest group pressures can promote or dissuade such decisions. Accordingly, water authorities should

have independent budgets and chief executives appointed for fixed terms and protected from arbitrary removal.

- River basin level organizations are valid options for water management. Critical requirements for their creation include a precise definition of their specific exclusive functions focused on water resources, and adequate authority and funding.

Regarding regulatory agencies for drinking water supply and sanitation services:

- Clear institutional separation between the functions of sector policy formulation, regulation and provision of services.
- The regulator must have independence and stability, and be subject to rules of good conduct and ethics.
- The regulator must have the necessary powers and resources.
- The regulator must have appropriate legal capacities.

Regarding future challenges such as climate change:

- Improving information on water availability its uses and users, and the expected impacts of climate change both on the water cycle as well as on water use and users, and defining clear channels for taking this information into account in water management decision-making processes.
- Studies are required on the sensitivity of water systems to possible future variations in climatic conditions.
- Establishing clear criteria to determine the scope of water rights (and wastewater discharge permits) during shortages and improving possibilities for imposing conditionalities, favouring environmental sustainability and resiliency objectives.
- More precise definition of preferences and priorities in water allocation, especially during shortages.
- Achieving better integration between the management of surface and groundwater, between water allocation and pollution control, between managing water demand and supply, and between the management of water resources, land, and related ecosystems.

In Table 2, the key lessons highlighted in the case studies presented in the regional session are summarized. They exemplify approaches and concrete actions that have been undertaken to improve water resource management; make water supply and sanitation services financially and environmentally sustainable, and improve water governance.

TABLE 2 Lessons Learnt from the regional Cases presented at the conference

Case	Lessons Learnt
Greening of public water utility regulation: lessons from the National Superintendency of Sanitation Services (SUNASS), Peru	Cost recovery tariffs coupled with clear and transparent subsidies for low income families is an efficient way to rationalize water use and increase coverage of water and sanitation services. However, an important precondition is public investment in the universalization of service coverage Providing access to the drinking water and sanitation services can be used as a way to alleviate extreme poverty and exclusion Projects designed with the consideration of the environmental dimension present reduced maintenance and operative costs; future expenditures on new supply infrastructure are avoided Communities accept subsidizing those who cannot afford to pay for water services, however, they are not willing to pay on behalf of "free riders" It is necessary to acknowledge the cultural and environmental context on a case by case basis, there is no solution that can fit all Transparency in the water bill enhances the end user understanding of his or hers water consumption
Design and approval of the Multi-annual Sectoral Plan for Water and the Environment and the creation of the Specific Water Cabinet, Guatemala	Policy coherence and coordination is necessary to improve water management Consensus building at the national and local level among relevant stakeholders is key for success The role of institutions and organizations outside of the water sector can be critical to the success of water governance within the sector Political commitment and innovative approaches can generate positive changes
Public management of water in Colombia	Colombia has a legal, institutional and financial framework that allows to implement measures for the regulation of water use and to ensure a sustainable development of production and consumption When price signals are applied properly and with appropriate institutional enforcement, the positive effects on the rationalization of the use of water are clear and effective A financial strategy of environmental investment ¿associated with economic growth and the use of natural resources? is more effective than exclusive dependence on the political will of national authorities Financial sustainability of the water authorities is necessary, but not sufficient, to ensure the effectiveness of water management While supervision and control of water users is necessary, appropriate monitoring of water authorities by the control entities and the citizenship is also essential
Community water management in Central America as an environmental, economical and socially feasible choice	Community based management can be a low cost efficient initiative especially for low income groups This level of involvement generates /should make use of economies of scale that enhance the provision of services The approach used by the communities involves not only water management but also the protection of forests, recharge areas, integrated watershed management, and sustainable agricultural practices Water has become a valuable resource for agricultural purposes and for small scale hydroelectric generation The development of networks has allowed knowledge sharing and the adoption of best practices in different communities
Prices that reflect the costs and benefits to the poor in Bogotá and Medellín, Colombia	Cost recovery and financial and economic instruments help reduce water consumption Financial sustainability of water utilities can be attained, reducing their dependence on government budget allocations Communication strategies emphasizing the value of water and the benefits of paying its cost and the support from the local mayor were necessary for the successful implementation of the tariffs

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III. Case studies from the region

Specific Water Cabinet of the Presidency of the Republic of Guatemala[6]

In response to the need for coordinating the management and governance of water with national development, the Government of Guatemala created the Specific Water Cabinet (GEA) as the coordinating agency for policy, planning and budget. The most significant changes resulting from implementation of GEA are:

- Making the process of defining and monitoring public policy related to the management and governance of water one of the priorities of national public policy.
- Establishing a coordinating agency at the highest political level.
- Linking the national water policy to, particularly, social policies and rural development, environmental and climate change policies.
- Setting common goals, objectives, and strategic lines of action for all governmental agencies, thus establishing a point of reference for local institutions.
- Contributing to improve institutional performance at the ministerial level, adding value to actions taken as a means of achieving both sector goals as well as objectives of a national nature.

Institutionally, GEA's coordinating work has allowed for separating the management and governance of water from the management and preservation of the environment; has identified the relationships of interference and interdependencies between water and

6 Elisa Colom de Morán, Specific Water Cabinet of the Presidency of the Republic of Guatemala.

ecosystems; and has highlighted the need for administering the environmental goods and services provided by water in a specific and specialized manner, distinguishing them from those provided by forests and biodiversity. It has also clearly demonstrated that the leadership role of the Ministry of the Environment and Natural Resources (MARN) of protecting, improving and recovering water resources must be strengthened, precisely so that it can perform the function of directing, regulating and supervising as regards quality, quantity and conduct; and, at the same time, it must set itself apart from activities corresponding to other governing bodies, such as measuring the resource and administering use rights, and those activities where joint, horizontal action is indispensable, such as risk management.

GEA's greatest institutional challenge has been to generate favourable conditions to create incentives for and implement a national strategic water management process that promotes the use of water resources to further national development goals and objectives. With the establishment of the National Water Policy (2011), common objectives, principles, directions and strategic lines have been defined, such that sector actions and budgets at the national level are in line with both sector and thematic goals and objectives as well as national and public interest ones, and municipal governments and the system of development councils have a national point of reference. In terms of water governance, GEA has helped to bring about a transition from public sectoral management void of any inter agency planning or coordination to coordinated management, establishing policy, planning and budget tools based on a common policy and strategy; progress was made in defining a Multiyear Sectoral Plan for the Environmental and Water; and, where risk management is concerned, the focus has shifted from responding to emergencies caused by natural events to addressing the causes of water-related risks.Since its creation, GEA has managed to establish the National Water Policy and its respective strategy; participate in constructing and applying the Multiyear Sectoral Plan for the Environmental and Water, as well as elaborating and applying the Plan for Recovery and Reconstruction with Transformation. It has also brought about institutional changes in the Ministry of Public Health and Social Welfare (MSPAS), in terms of leadership in drinking water supply and sanitation services, and regarding the definition and implementation of a policy for transboundary waters. An institutional mechanism for coordinating water policies at the highest level, like GEA, could be used as a model in cases where countries are lacking solid institutional structures or national water policies that guarantee the fulfilment of public interest objectives.

Pro-poor financing and tariffs in Medellin, Colombia[7]

Colombia, as is the case of many countries of the region, has implemented different economic reforms to improve the living standards of its population. In the public utilities arena, measures have been taken in terms of tariff structure and changes in the institutional framework. However, there are still economic, social and legal barriers that have hindered the achievement of universal coverage of drinking water supply and sanitation services, especially for the poorest segments of the population.

People living in poverty face innumerable access problems related to the lack of financial capacity to afford a minimum water service allowance, and the inability to save enough money to pay for their consumption. This has been a crucial issue in the water sector in the developing world for many decades. In addition, experience shows that low or no income is not the only barrier inhibiting access to water services. Other conditions associated with poverty in these areas, such as social unrest, violence, unemployment and underemployment, urban displacement, and other related factors, threaten to undermine economic efforts to guarantee access to services.

In many cities in the developing world, as in Medellín, the poor peri-urban population not only lives under "border" economic conditions, entering and exiting the formal world, but also in extreme social, legal, and institutional situation. This interception of multiple geographical, economic and social stress factors constitutes a major challenge to extending water services coverage to these areas. Moreover, this population is more vulnerable to external social and economic shocks (unemployment, sickness or death of members of close social networks, etc.).

Governments in association with utilities in the developing world have a responsibility to address these challenges in services provision. The experience of Empresas Públicas de Medellín (EPM), water services provider for Medellín and the Aburrá Valley[8] in Colombia, is to combine formal public policies at the local and national level with its own corporate social responsibility policies to create shared values in the benefit of the weakest segment of the population. A portfolio of initiatives has been specifically designed with the aim of guaranteeing universal access to public services, and to prevent this vulnerable population from falling into a poverty trap that impedes the possibility of connection and consumption of these essential and vital services.

About EPM

EPM is a Colombian company owned by the Municipality of Medellin. EPM is a public utilities providing water, electricity, gas and telecommunications services, and its main market is the metropolitan area of Medellin and the Department of Antioquia, with population

7 Rubén D. Avendaño, Empresas Públicas de Medellín.

8 The Aburrá Valley is the basin of the Medellín River and one of the most populous valleys of the Andean Region of Colombia with more than 3 million inhabitants. It is home to ten cities: Medellín, Barbosa, Bello, Caldas, Copacabana, Envigado, Girardota, Itagüí, La Estrella and Sabaneta.

of 5.2 million people. It is the second largest water and sanitation utility in Colombia and currently its profits transferred to the municipality represent around a third of the latter's annual budget.

EPM is recognised nationally and internationally for its efficiency and quality operations. It demonstrates good financial results, high service quality standards, high credit ratings by national and foreign financial agencies and the social acknowledgment[9] of its performance and commitment to improve the quality of life of its customers, especially the poor.

EPM projects are developed in accordance with strict financial, technical and legal principles, and all its procedures and controls for the acquisition of goods and services guarantee transparency in all contractual processes. Its management and directors are independent of any political influence. In addition, EPM's corporate governance model and its corporate social responsibility policy have become important drivers for the growth and sustainability of the company.

The approach: cost recovery and financing mechanisms

Understanding that the access problem is critical in Medellin, EPM has designed and implemented a variety of solutions tailored to target people with different needs.

A key issue regarding how to overcome the barriers to the poor is the institutional capacity to understand the problem and to design and implement effective solutions. EPM has the institutional capacity for managing the entire process from problem identification to the implementation and evaluation of the programs. This process requires first of all, a clear understanding of the initial situation to enable the formulation of appropriate and comprehensive strategies. A conceptual framework is first developed, based on interdisciplinary studies and an in-depth analysis of the user's economic and social behaviour that is affected by rules, regulations and organizations. The next step is the planning of the intervention, identifying the roles and responsibilities of the actors involved (national government, local government, *nongovernmental organizations*, third parties, and the EPM itself), followed by the design of mechanisms that better respond to the main objective — service universalisation. Finally, during and after implementation, the development and application of permanent monitoring and evaluation techniques is essential.

In the pursuit of its goals as public services provider, and in response to the challenges faced in its service area, EPM has designed the following strategies to increase access to drinking water supply and sanitation services, prevent services disconnection and to improve the quality of life of its customers:

Network Connection Financing Program (NCFP)

The NCFP is an EPM initiative designed to provide access to water services to low-income households in the peri-urban areas of the Aburrá Valley. The program offers long-term

9 As demontrated in the survey "Medellín cómo vamos", a civil initiative created in 2006 to evaluate the quality of life in the city of Medellin (http://www.medellincomovamos.org/).

credit facilities at low rates to people who currently have no access to credit. Beneficiaries of the program are then able to finance the construction or improvement of in-house and external water and sanitation infrastructure in order to gain access to public utility services. EPM offers this service based on household demand and credit is payable over ten years at the average market interest rate for deposits (DTF rate). The credit component of the program is accompanied by infrastructure contracts that are awarded to formally organised community entities, helping to strengthen local technical and business capacity.

Financing and Re-financing Consumption (RFWC)

The purpose of this EPM initiative is to help households with low capacity to pay (strata 1, 2 and 3[10]) and debts in their water, sanitation and energy bills, to have access to low cost financing with minimum guarantees to prevent delinquent accounts and service disconnection. Before service suspension, clients have option of paying 80% of their debt within their current bill and the remaining 20% the following month without charges. Disconnected clients with over two months of bill debts are offered reconnection agreements and the financing of the debt for up to five years at DTF rate. In the case of clients that have been affected by displacement or natural disasters, the debt can be refinanced for up to ten years with no interest.

Prepaid Program (PP)

PP is an EPM initiative targeted at customers with delinquent accounts or that are at risk of having an illegal connection. The program allows reconnection of services (which are prepaid) and debt payment over 120 months charged at DTF rate. The customer purchases a PIN number from a local store and introduces it in their meter at home to use the energy services purchased. Of the payment made through the PIN, 90% is for the purchase of energy and the remaining 10% contributes to repayment of the debt with EPM. Thus far, EPM has only implemented this program for energy services but offering a prepaid option for water services is being piloted.

Social Financing Program (SPF)

The SFP/EPM Group card offers households credit at competitive rates that vary according to the type of product or activity financed. Priority is given to strata 1 to 4 households which constitute 96% of cardholders. The credit is intended for use in financing home improvements and energy and water appliances, with the objective of improving efficiencies and the quality of life of customers. The credit is billed in monthly instalments with the utility services.

Community Organisation Contracts

The objective of this social program is to contract community-based organisations and associations located in areas where EPM has water and sanitation network expansion, operation and maintenance projects. EPM hires these organisations to build local

10 Colombian legislation has established a household classification system with six socio-economic categories (strata 1 to 6) according to location, income level and public services provision. This classification determines people's taxes, public services tariffs, modalities of access to health service, among others. Strata 1, 2 and 3 have preferential treatment to receive governmental subsidies and benefits due to their low socioeconomic conditions.

infrastructure and the procurement requirements are specifically designed to enable them to obtain contracts.

Water services provision in peri-urban areas

This initiative is implemented by EPM in conjunction with the Municipality of Medellin and seeks to legalise and allow access to water services for people in peri-urban areas in Medellin. The charge is applied according to the average user's socioeconomic level without using individual meters.

Minimum Drinking Water Consumption Amount for Life

The average quantity of drinking water needed per person to meet basic human needs is 2.5 cubic meters per month. "Minimum Drinking Water Consumption Amount for Life" is a Municipality of Medellin initiative launched in 2009 providing subsidies to cover the cost of 2.5 cubic meters per month per person. Households targeted by the program are those in the rural or urban areas that have been previously identified as potential beneficiaries of social programs due to unmet basic needs. EPM applies the respective discount in the customers' bills. The program also includes information campaigns to promote the rational use of water.

National demand-side and supply-side subsidies

The national demand-side subsidies scheme offers users with low payment capacity (strata 1, 2 and 3) subsidies financed by a surcharge in the bill of users with the high payment capacity (strata 5 and 6) and industrial and commercial users, and by municipality funds. The level of subsidy depends on the strata: strata 1 receives a 50-60% subsidy; strata 2 a 30-40% subsidy; and strata 3 a 10-13% subsidy.

The national government also provides supply-side subsidies, investing in public services infrastructure so that public service providers can improve service delivery without passing on the additional cost to users.

Economic, environmental and social benefits

Initiatives offered by EPM have resulted in significant improvements in the life conditions of the population it serves. Some of its impacts are listed below:

Network Connection Financing Program (NCFP)

Economic impacts: During 1999-2011, 45 million dollars were invested in water and sanitation services through the NCFP. The program has resulted in a total of 5 million in interest rate savings for consumers compared to conventional financing. Indirect benefits of the program include the creation of almost 11 thousand jobs in the water and sanitation services sector.

Environmental impacts: EPM has wastewater treatment plants that clean residual water before it is discharged into the Medellin River. As the river goes through the entire Aburrá Valley, the NCFP reduces water pollution by connecting users to the sewerage system.

Social impacts: Direct impacts on water and sanitation provision during 1998-2010 include: over 10 thousand household connections to water services and almost 14 thousand sewerage connections, benefitting some 56 thousand people. During 2008-2010, the water network was expanded by over 50 kilometres and the sewerage one by 55 kilometres. The program has also involved more than 23 thousand hours of community training and has contributed to poverty alleviation through job creation.

Financing and Re-financing Consumption (RFWC)

Economic impacts: The RFWC financed almost 330 thousand customers at a total cost of 95 million dollar during the 2008-2010 period.

Social impacts: Of the beneficiaries of the program, 92% are low-income households (strata 1, 2 and 3). The scheme has therefore addressed inequities and contributes to the improvement of quality of life of its beneficiaries.

Prepaid Program (PP)

As the PP initiative is currently being trialled for water services, only the energy program has been fully evaluated, with the following results:

Economic impacts: During the 2008-2010 period, the program saw investments of 9.3 million dollars. Importantly, PP allows customers to consume public services according to their economic capacity without facing any payment risk and preventing disconnection.

Environmental impacts: The program includes education in rational energy use, which has resulted in a reduction in consumption of 60 kilowatt hour per family.

Social impacts: A total of almost 71 thousand network connections have been made in the last three years, benefitting some 202 thousand people (with 7% from strata 1, 2 and 3). The program will enable 88 thousand disconnected clients to regain access to energy services by 2014. It contributes to the improvement of quality of life and provides a mechanism to avoid illegal connection to public services.

Social Financing Program (SPF)

Economic impacts: Over a three year period, SPF financed 28 million dollars. The program promotes credit channels for people who otherwise would not be eligible for financial services, with low interest rates and repayment flexibility. It stimulates local, regional and national economies.

Environment impacts: The SFP has facilitated the adoption of a new generation of efficient appliances, contributing to significant energy, water and gas savings, with corresponding environmental benefits from reduced resource use.

Social impacts: As of August 2011, the EPM Group Card has financed 63 thousand households in 17 municipalities. The scheme has issued almost 40 thousand cards in three years. Participants benefit from reductions in bills due to the use of more efficient appliances.

Community Organisation Contracts

Economic impacts: During the 2008-2010 period, 31 contracts with organisations in Aburrá Valley were made, totalling 10 million dollars. The initiative has generating almost 400 jobs in the water and sanitation sector. This has enhanced the income of communities and contributed to the distribution of wealth, stimulating local, regional and national economies.

Environmental impacts: The community organisation contracts include environmental protection clauses complemented with auditor procedures to verify compliance.

Social impacts: The initiative has contributed to poverty reduction as a result of job creation; strengthened skills in management, operation and procurement; and successfully promoted community-based schemes.

Water services provision in peri-urban areas

Economic impacts: During the 2008-2010 period, 126 thousand dollars was invested in water services provision for peri-urban areas.

Social impacts: This programme contributes to the universalisation of public services, risk reduction and life quality improvement for peri-urban populations. during the 2008-2010 period over 6 thousand people benefited. Customer education programs have been implemented to encourage sustainable and rational water use.

Minimum Drinking Water Consumption Amount for Life

Economic impacts: The Municipality of Medellin has invested a total of 1.2 million dollars in 2010. In that year, the total savings achieved were 270 thousand dollars, equivalent to a 12% (about 5 dollars) in monthly savings per family — resources that vulnerable families can invest in meeting other needs.

Environmental impacts: 92% of beneficiary households practice rational water consumption, with corresponding environmental benefits.

Social impacts: The program provides a specific quantity of drinking water at no cost to vulnerable families in Medellín. It has brought positive results and improvements in social conditions. In 2010, some 26 thousand households benefitted from the program and for 2011, they are expected to rise by 72% (45 thousand households). By guaranteeing vulnerable families' access to water, the municipality is improving economic, social and health conditions of its population. The incidence of illness is reduced as a result of the increased availability of drinking water supply.

National demand-side and supply-side subsidies

Economic impacts: During the 2008-2010 period, over 140 million dollars in water and sanitation subsidies were provided to the lower income population (strata 1, 2, 3) of 17 municipalities, reducing the cost of water and sanitation services for users. On the sup-

ply side, EPM has received almost 20 million dollars in public investment for water service provision.

Social impacts: The initiative has benefitted some 700 thousand users and addressed social inequities in the region.

Scaling up and relevance for developing countries

To address the access problem, most developing countries have copied models from elsewhere in the pursuit of higher standards of living. But experience shows that due to different social, economic, legal and cultural conditions between countries, models cannot simply be transplanted with success guaranteed. It is therefore necessary to identify common factors from which the transferability of an approach can be inferred.

Opportunities for the future

EPM has recently hired a consulting service to assess delinquent accounts and effectiveness of EPM tools in reaching public services universalisation. The main conclusion of the study was that current initiatives offered by EPM to vulnerable users are achieving good results, but in order to help people living under vulnerable conditions (less than 5% of EPM target population) move up in the social scale, the following changes were needed:

- restructuring existing initiatives and creating new and complementary tools (such as insurance mechanisms against shocks like death, illness or accident);
- focalizing strategies leading to the development of differentiated options according to users' vulnerability levels (measured by poverty level and delinquent account risk); and,
- collaboration in efforts with other actors concerned with the situation of vulnerable population.

In addition to local and national governments, there are international agencies, non-governmental organisation and private entities that allocate resources and are interested in implementing programs to improve social welfare. Furthermore, more efforts must be made to link EPM actions to local and national policies for poverty reduction in order to concentrate focalisation strategies in the same population and improve their effectiveness.

Lessons learnt from implementation

- **Know your target population well.** Programs targeting the poor must be designed on the basis of a thorough analysis of the beneficiaries' conditions and their local particularities in order to structure flexible and custom-made options for social improvement. This requires interdisciplinary study of economic, social and psychology

behaviour, as well as of the rules, regulations and institutions that affect social conducts.

- **A successful program in one particular context does not necessarily guarantee success when the practice is transferred** even to a similar context. As initiatives are designed to solve a specific situation, what can be transferred is not the practice itself but the building processes or principles involved in its design and initiation.

- **Do not think the target has been already reached.** Constant monitoring and evaluation is essential to identify deviations from the expected outcomes or to introduce improvements leading to increased efficiency and effectiveness of measures.

- **Investment in social capital of the community** contributes to socioeconomic development and generates positive externalities.

- **Credit is not the solution** when it does not contribute to income generation or savings for consumers. Thus, credit options for delinquent accounts must be considered just as temporary measures so as to avoid consumers' dependency or poverty traps.

- **Joint efforts generate high impact.** Collaboration and cooperation between governments (both municipal and national) and between private and public entities is the best way to support the expansion of water supply and sanitation services and invest in social welfare, through joint commitment to the achievement of a common target. The responsibilities and roles of each actor should be clearly identified.

The Fund for the Protection of Water (FONAG), Ecuador[11]

The Fund for the Protection of Water (FONAG) is a private trust fund established in 2000 for a period of 80 years and regulated under Ecuador's stock market law. Essentially, the Fund is an example of payment for the environmental services provided by ecosystems (commonly referred to as Payment for Ecosystem Services or PES).

FONAG works to ensure the provision of a sufficient quantity of water of good quality by supporting actions directed at protecting water resources, based on the principles of long-term natural sustainability.

FONAG focuses on the Upper Guayallabamba, Oyacachi and the Papallacta river basins which are crucial for maintaining the water supply to the Metropolitan District of Quito and its surrounding area. FONAG's area of operation covers over 5 thousand square kilometres and is home to about 2 million inhabitants.

In order to avoid the degradation of these river basins, FONAG is supporting actions directed at making the activities of local communities more sustainable but also more productive.

Activities in the Antisana river basin are directed towards protecting the quality of water entering the Mica Quito Sur reservoir, part of the system that provides drinking water to the city of Quito. The main problem in this river basin is related to poor livestock management practices in nearby areas, which cause water pollution, soil erosion and adversely impact nature conservation in the Antisana Ecological Reserve. Preparatory studies at an estimated cost of 22 thousand dollars are currently underway, with equal contributions by FONAG and the nongovernmental organisation, The Nature Conservancy (TNC), and additional counterpart funding from the implementing institution.

About FONAG

The inter-Andean area of Pichincha Province (in the Quito basin) is one of Ecuador's most densely populated area and faces one of the worst problems of water shortage, competition and pollution. The water needs of the population of this area are supplied by surface water from the upper Esmeraldas river basin, ground water and some transfers. The aquifers surrounding Quito used to be an important source of drinking water supply. However, the deterioration of wells and the economic and operational advantages of surface water supply systems have led to the progressive closure of wells. In order to supply the needs of the population, water has to be transferred from river basins in the Amazonian region: drinking water for Quito is extracted from the Antisana, Oyacachi and Papallacta rivers; water for the Tabacundo irrigation project from the Boquerón, Monteras and San Jerónimo rivers;

11 Thomas Chiramba, Silas Mogoi and Isabel Martinez, United Nations Environment Programme; Tim Jones, DJ Environmental, and Pablo Lloret, FONAG.

and irrigation water for Cangagua from the River Oyacachi. The situation has been worsened by a deep crisis in national water resources management, owing to irregularities and deficiencies in water allocation and poor administration of water-related conflicts.

The approach: payment for environmental services (PES)

The proposal to create FONAG was headed by TNC on the basis of analytical studies and the programme of communication and education on water-related issues in Quito, which were both developed with the assistance of the United States Agency for International Development (USAID). The Metropolitan Drinking Water and Sewer Company of Quito (EMAAP-Q) and TNC signed the contract creating the fund on 25 January 2000. It was set up as a private trust fund under national stock market law. The National Electric Company joined the venture in May 2001; Andean Brewery in March 2003; the Swiss Agency for Development and Cooperation (COSUDE) in January 2005; and Tesalia Springs, a company selling bottled spring water and related products, in April 2007. Members' contributions vary between a fixed rate of 1.25% (in 2008) on the drinking water and sewerage sales of EMAAP-Q, to a fixed annual amount paid by other participants. The fund currently holds close to 6 million dollars and investments were estimated at some 0.8 million in financial returns and 2.9 million in counterpart funds.

A pilot project was set up in 1998, payments to FONAG began in January 2000 and financing of watershed protection projects was initiated in January 2002. The trust fund provides a stable, long-term financial mechanism, using revenues derived from its equity to co-finance activities aimed at maintaining the river basins that supply the water needs of Quito Metropolitan District and its surrounding area.

FONAG implements programmes and projects that meet the institutional challenges of building a new "water culture" (where the active and responsible participation of all stakeholders and actors creates a more just, shared and sustainable use of water resources with improved health and development outcomes) and advancing towards integrated water resource management. To do this, it developed a clear mission:

FONAG rehabilitates, cares for and protects river basins and watersheds that supply water to the Metropolitan District of Quito and surrounding areas.

Its mission is to be the mobilising agent that involves all actors in exercising their citizenship responsibly on behalf of nature, especially water resources.

Communities particularly targeted by FONAG programmes and projects include those located in:

- the Cayambe-Coca Ecological Reserve (Oyacachi river basin)
- the Antisana Ecological Reserve (Papallacta river basin and La Mica Lagoon)
- the Cotopaxi National Park (Pita sub-basin of the Upper Guayallabamba)
- the Los Ilinizas Ecological Reserve (San Pedro sub-basin of the Guayallabamba)

The activities implemented by FONAG are the result of various consensus-based processes carried out among the participating institutions.

Through the Ecuadorian Centre for Agricultural Services (CESA), FONAG is seeking to conserve water resources, improve animal husbandry and agricultural practices, strengthen local capacities and provide access to financial services. All these components were developed during an initial implementation phase lasting fifteen months, at an estimated cost of about 80 thousand dollars, with part-funding provided by FONAG and co-financing from TNC and CESA.

Among other practical actions, work is being done to improve livestock management around the Oyacachi river basin, through a campaign to vaccinate, identify and execute a programme to provide these herds with vitamins and rid them of parasites.

These programmes and projects are carried out with the participation of various community actors, local authorities, governmental bodies, non-governmental organisations, and educational institutions.

FONAG implements its programmes directly, conceiving them as a way of building processes that are capable of changing people's attitudes toward nature and encouraging responsible water resources use and management.

The programmes have a minimum time scale of 20 years and cover all six key areas of FONAG's activities:

- Water management.
- Site surveillance and monitoring.
- Restoration of vegetation cover.
- Environmental education.
- Training in integrated water resources management.
- Communication.

The projects are interventions undertaken by supporting institutions, communities, educational organisations and local governments. They are short-term, with a maximum duration of two years. There are currently 20 such projects covering all of the sub-basins within FONAG's area of operation. Of the institutional budget, 20% is assigned to these projects.

Financial approach

The capital assets of the FONAG are composed of contributions from local businesses, private and international institutions. Specific projects are an integral part of FONAG's six

programmes, which are led by like-minded institutions with co-financing provided by FONAG. Its success is based in large part on:

- A philosophy of modest but steady growth.
- Limiting its financial support for programmes/projects to the revenue derived from its equity capital.
- Attraction of increasingly significant counterpart funding.

By 2009 FONAG was making financial contributions of almost one million dollars per year and leveraging counterpart funding to fund programmes and projects with total expenditure of nearly four times this amount.

Economic, social and environmental benefits

Through the fund, more than 65,000 hectares of watersheds are now under improved management. Upstream farmers receive support for watershed protection programmes, as opposed to cash payments. Almost two thousand people are estimated to have received increased economic benefits associated with watershed management and conservation.

Scaling up and lessons learnt from implementation

Lessons learnt:

- Governments, nongovernmental organizations, both national and international, development assistance agencies, the corporate sector and local communities can work effectively together on PES schemes if the benefits for all stakeholders are clear.
- Relatively modest expenditure can leverage much bigger overall investment through counterpart contributions.
- Restricting use of the fund to yields from interest and investments —not capital— means that the fund grows slowly but sustainably.
- Strong capacity building and communications and awareness-raising components have been vital to FONAG's success.
- A stable, long-term financial mechanism provides the security, stability and sustainability needed for partners to feel confidence in participating in FONAG and facilitates its operation.

Water's potential role in supporting a green economy in Barbados[12]

Barbados is a water scarce and densely populated small island developing state with an open economy dependent on tourism and its use of its tropical island attributes, the importation of fossil fuels and a substantial part of many of its nutritional needs. The challenge facing the country is how to respond in a way that is sustainable, provides increased employment opportunities in a way that does not compromise the country's environmental resources while at the same time optimising their use and contributes to the well-being of citizens. In 2009, the then Prime Minister announced his vision for Barbados to become "the most environmentally advanced green country in Latin America and the Caribbean". Following this decision, the Government of Barbados initiated a scoping study to map out how this vision could be achieved.

The commitment has been reiterated by the current Government, through the Prime Minister and the Minister for Environment and Drainage. Barbados has a track record of championing environmental issues and concerns on the international stage and domestically successive Barbadian governments have sought to promote environmentally responsible development through national development plans, policies and projects. The challenges faced in making the change were:

- The need for better institutional coordination and the uptake and mainstreaming of "green" policies.
- Limited economic resources for implementation.
- A need for better public awareness and change of mindset as well as greater private sector involvement.
- What constitutes a green economy is not uniformly well understood and therefore the ability to translate understanding into action is limited.

It is clear from the scoping study that the legal and especially the regulatory institutions have to be adapted to be supportive of green initiatives and that a higher priority needs to be assigned to such changes to enable them to become part of an engine for growth. At the same time there is a need to be more inclusive of the private sector in areas that have previously been the preserve of government in service provision and this will need a change in mindset on the part of both government and private sector. A key challenge is the creation of a supportive set of financial instruments that lowers the cost of adoption and implementation for all parties.

While there is a commitment on the part of senior decision-makers, at the same time, the study suggestions that where there is a perception on the part of middle managers that adoption of green orientated policies might increase costs. Furthermore the need for greater environmental protection is on the one hand not always properly appreciated, and

12 Adrian Cashman, CERMES - University of the West Indies.

on the other, there is a tendency in some sectors to be conservatively prescriptive. Policy coherence and coordination emerged as an area where more attention is required.

It is anticipated that some of the outcomes with respect to how water planning and management can be promoted will be of relevance to other developing and transition countries. It is currently too early to tell what the impact might be on the creation of new employment and business opportunities though it is expected that the promotion of a green economy will lead to new employment opportunities. Already a centre for the promotion and support for transitioning existing businesses to green economic practices is being discussed. The potential benefits to the environment have been identified and this is especially important given the existing stress that existing economic activity is responsible for, the limited endowment of certain key natural resources and their vulnerability.

IV. The expert's perspective

During 2012 several leading experts on water issues were asked to answer a series of questions related to water in the green economy and the most relevant issues and tools related to its implementation (Annex 1 and 2) in Latin America and the Caribbean.

These interviews aim to shed light on some of the experiences that have worked in the region and the thinking of those closely involved in the development of policies, programmes and strategies that can help the region on its path of transition towards a green economy.

Interview with Colin Herron, Grisell Medina and Frederik Pischke from the National Water Commission of Mexico (CONAGUA)

1. **What is your vision of the green economy and of the role of water resources management and utilization in its context?**

   A green economy depends on the sustainable and integrated management of water resources. Water needs to be managed more rationally to face the challenges of growing populations, increasing per capita consumption and the manifestation of climate change and variability. Let's not forget that water is embedded in the products we consume and that the provision of water consumes energy, just as the provision of many sources of energy requires water resources. Clean water is thus a resource that we need to protect so as to make the transition to a green economy possible.

2. **What is the role of water in the transition to a green economy in Latin America and the Caribbean?**

   Despite abundant water resources and a relatively strong economy, the region faces a challenge to distribute its wealth more equitably, enabling economies to develop with-

out depleting natural resources. A concrete example is reducing the wastage along food supply chains, thus saving water and energy while limiting the land needed to provide additional nutrition. Many issue-specific solutions imply unintended negative impacts. Thus there is a need for conscientious trade-offs to be made between water, energy and food, with progress evaluated against the three pillars of sustainable development.

3. **What are the main priorities in improving water resources management and utilization to move towards a green economy?**

   Agriculture and energy are the main priorities for water resources management. The research that provided input into formulating Mexico's 2030 Water Agenda estimated that the gap between supply and demand in Mexico by 2030 would be 23 billion cubic meters. The cost of closing this gap would be more than USD 4.16 billion annually. Money is not the only obstacle; nor is it the most complex. The majority of the initiatives that make up this Agenda are related to the reassignment of legal functions, capacity development and the implementation of economic incentives for a more rational use of water.

4. **What are the main barriers that inhibit this process towards integrated water resources management, efficient, equitable and sustainable water utilization to transition into a green economy?**

   Political will is sometimes lacking to provide adequate incentives for the equitable and rational use and reuse of water resources and to establish an enabling environment, through investments in strong water institutions and human capacity, as well as natural and built infrastructure. The price of water in most countries of LAC does not reflect its real value, as shown by tariffs that do not cover operating and maintenance costs. The business community needs to embrace water as a strategic asset that has to be protected throughout its supply chain. In this sense, the whole of society can have a big impact by making water issues one of the top priorities through daily actions in responsible consumption of goods and the protection of water resources.

5. **Which tools or measures do you think would be most effective to ensure progress in this area? What are the most interesting or promising examples in the countries of the region?**

   To give a concrete example, the Government of Mexico has established through a participatory process its 2030 Water Agenda, which lays out a series of objectives and related actions, as well as a timeframe and reporting process to achieve the balanced supply and demand for water resources, clean water bodies, universal access to water services as well as settlements safe from catastrophic floods. The Agenda is not just a government commitment, but is an initiative by the whole of Mexican society, thus ensuring that water issues are a top priority for all interested stakeholders, not just water managers.

6. **Taking into account the severe social inequalities in Latin America and the Caribbean and the relatively low level of economic development, how can we make sure that the transition towards a green economy is "inclusive"; contributing to poverty alleviation instead of aggravating inequalities?**

   A green economy needs to play close attention to the three dimensions of sustainable development it is intended to achieve. The equity aspect requires us to ensure that every person has access to safe and clean drinking water and adequate sanitation, which provide the basis for leading a productive life. Although a huge achievement in itself, we cannot stop there. What is also needed is an integrated approach to water resources management that ensures that the voices of all water users have a position at the negotiation table, as water resources are managed for an economic development that benefits all.

7. **What messages would you like to deliver to the United Nations Conference on Sustainable Development (Rio+20)?**

   Water is a vital resource for sustainable development and should be considered a crosscutting element for any issue related to the environment, social wellbeing and economic development. Solving water management challenges will help us advance significantly in eradicating poverty, achieving food security, adapting to and mitigating climate change, improving public health, enhancing energy generation and use, balancing sustainable rural and urban development and maintaining ecosystem services. Let's focus on working across disciplinary boundaries and advancing practical solutions that can allow a growing population to live harmoniously and sustainably in a changing climate.

The expert's perspective

Interview with Victor Pochat, independent consultant

1. **What is your vision of the green economy and of the role of water resources management and utilization in its context?**

   Although I am still trying to understand better the actual meaning of this approach, my first reaction to the working definition developed by UNEP for a green economy - "as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities"- is to wonder if it is enough to give to economy, together with the comprehensive adjective "green" -which seems to involve the social and environmental issues- an almost unique role for the solution of the main worldwide problems. Nevertheless, whatever is the scope of that definition, the role of water resources management and utilization will be always substantive, given the close relationship between water and all the social, environmental and economic sectors.

2. **What is the role of water in the transition to a green economy in Latin America and the Caribbean?**

   Given the magnitude and particular importance of Latin America and the Caribbean natural resources and the variety of impacts of global changes on its extensive territory, water should be present in all economic decisions and the corresponding consideration of their social and environmental consequences.

3. **What are the main priorities in improving water resources management and utilization to move towards a green economy?**

   - Development of more efficient technologies for reduction of water consumption in agriculture, industries and urban areas and for wastewater treatment.
   - Development of new products in order to replace the current pollutant fertilizers and pesticides. Development of new technologies for reducing contaminants from industrial processes.
   - Careful consideration of social and environmental impacts in order to make possible the construction of multipurpose dams of different magnitude in order to satisfy water and clean energy demands.

4. **What are the main barriers that inhibit this process towards integrated water resources management, efficient, equitable and sustainable water utilization to transition into a green economy?**

   I consider that the main barrier is the lack of understanding and consequent commitment of the main decision-makers, who generally are those authorities related to the political and economic fields and not to the water resources field. This happens even when the global agenda and public declarations show water as a priority. Other important barrier is the lack of involvement in water resources decisions of representatives of health, social and productive sectors, such as agriculture, energy and industry, and even of environmental fields related to other natural resources, such as soils, forests and fisheries.

5. **Which tools or measures do you think would be most effective to ensure progress in this area? What are the most interesting or promising examples in the countries of the region?**

   To ensure progress in this area it would be necessary the strengthening of the governmental areas responsible of water resources management, by themselves, and by their close relationship with the other governmental areas, as well as by a long-term planning within the different areas of water management. Interesting examples is the organization of the National Water Resources Management System of Brazil and the planned development of the Water Supply and Sanitation services of Chile.

6. **Taking into account the severe social inequalities in Latin America and the Caribbean and the relatively low level of economic development, how can we make sure that the transition towards a green economy is "inclusive"; contributing to poverty alleviation instead of aggravating inequalities?**

   Given that the establishment of a green economy implies processes of capacity building for the development of new technologies, particular efforts should be made to incorporate the necessary tools in the basic education programs for training of children and the updating plans for adults, in order to reduce the current gaps in knowledge, one of the main causes of social inequalities.

7. **What messages would you like to deliver to the United Nations Conference on Sustainable Development (Rio+20)?**

   I would like that water issues deserve a more important consideration than in 1992 Rio Conference, by recognizing the vital role of water for other natural resources and the environment in general and its key role in all the productive processes and their social implications. On the other hand, it would be necessary that all the actors related to environmental issues understand the necessity of getting out of the "environment box" and make especial efforts to strongly commit to the many important decision-makers acting in the political and economic fields in order to work together towards a sustainable development.

The expert's perspective

Interview with Maureen Ballesteros Vargas, President of Global Water Partnership (GWP) Costa Rica

1. **What is your vision of the green economy and of the role of water resources management and utilization in its context?**

   My approach of a "green economy" is based on the need of a more sustainable growth of countries in which the value of the natural resources and human capital is recognized; this growth should gradually create a greater welfare for all. Water is a linker element of development and therefore it is essential for a sustained growth of a country. Through water, a significant increase in levels of inclusion of the poorest in the economy can be achieved. Also, an integrated water resource management is supported by an adjacent ecosystem management.

2. **What is the role of water in the transition to a green economy in Latin America and the Caribbean?**

   The IWRM is a vital element for effective growth, health improvement of the population, equitable access to water and sanitation, and resource sustainability for the future through the protection of ecosystems.

3. **What are the main priorities in improving water resources management and utilization to move towards a green economy?**

   There should be profound institutional reforms in Latin America that would allow water management institutions to have a balance between development and conservation and where the concept of "green economy" is transverse to the work and tasks of these institutions (Green Institutional Culture).

   In order to make these reforms, in some cases it will be required legal changes, which we know is often difficult in Latin American countries. Also, the issue of funding is quite important. All these changes mentioned require investment resources that countries are not always willing to assign.

4. **What are the main barriers that inhibit this process towards integrated water resources management, efficient, equitable and sustainable water utilization to transition into a green economy?**

   One barrier would be the lack of political vision of decision makers on where to direct actions.

   A second issue is related to pressure groups of certain economic sectors which do not allow changes to be made. Also, in many of our countries, until a few years ago, there wasn't any pressure over allocation and access to water as it exists now. Thus, there is a new juncture in which countries do not know how to respond in a quick way. And finally, the fourth issue deals with the allocated financial resources in national budgets. Water management usually has a very low priority and all these changes mentioned before require an important investment in developing countries where there are always other urgent priorities. This situation delays investment aimed at reform.

5. **Which tools or measures do you think would be most effective to ensure progress in this area? What are the most interesting or promising examples in the countries of the region?**

   Initially, legal reforms that promote strong and resourceful institutions should be seen as priority. In order to accomplish these reforms we must work directly with legislators. Also, a cultural change must take place through greater citizen participation processes to raise awareness about the importance of water resources. The benefits of appropriate water management should also be included on national accounts. I would mention Brazil as a successful example since its legal reforms in 1997, the creation of the ANA and the management improvements made since then.

6. **Taking into account the severe social inequalities in Latin America and the Caribbean and the relatively low level of economic development, how can we make sure that the transition towards a green economy is "inclusive"; contributing to poverty alleviation instead of aggravating inequalities?**

   Water management processes are completely linked to national policy processes; therefore democratic schemes strengthen participation processes. Thus, it would be essential that countries respond to more participatory democracies. Also, the approach of "green economy" and related IWRM should not be discussed only on a technical level, it should also transcend to a political level; otherwise required changes will not be made.

7. **What messages would you like to deliver to the United Nations Conference on Sustainable Development (Rio+20)?**

   a. We cannot continue to visualize the growth of a country or region without taking into account the balance that must exist between the various social groups, economic sectors and the use of natural resources.
   b. An efficient water management allows the maintenance of healthy ecosystems, the reduction of poverty and the generation of wealth.
   c. Water security understood as ease of access, quality and availability facilitates development models.
   d. In order to make the necessary changes towards a "green economy" it is essential the participation of all decision makers.

Annexes

Annex 1. Tools for change

These tools have been identified by the United Nations Environment Programme (UNEP) to support the change towards a greener economy and were central in the discussions and presentations held in the Zaragoza Conference.

Economic incentives

This refers to introducing market-based instruments such as payment of ecosystem services; consumer driven accreditation and certification schemes, arrangements to send economic signals (including trading of water and offset schemes); reducing input subsidies including electricity; ensuring that incentives and subsidies do not conflict with or damage other sectors; introducing financial incentives for saving water; promoting the use of "best available technology" standards in industry; reviewing water allocation mechanisms to maximize the contribution of water to economic growth; providing effective price signals, and moral and financial motivation for changes in infrastructure and technology standards, social habits and attitudes, and standard business practices.

Green jobs

In the green economy scenario there are a number of governance and policy reforms necessary, as well as new investments. All of these affect the types of jobs generated, as well their quantity and quality. There is an overall need to improve skills and training, including through closer coordination between the public sector and private partners to identify education and training needs. Labour market and training policies can play a key role in facilitating the structural adjustments associated with the green economy while minimizing the associated social costs.

Water cost recovery and financing

This relates to improving water charging and finance arrangements. This needs to include improving access to financing for the poor. Cross subsidizing of water use may be considered to facilitate access to water services for the low-income groups. Establishing financing that creates incentives for eco-efficient technologies would support technology development, adaptation and adoption. Financing is important for the investments aimed at improving the effectiveness, efficiency and resilience of water supply and of water use. This includes financing for obtaining more value and crop per drop and replacing water-intensive crops; investing in replacing and maintaining old infrastructure, improving irrigation systems, and decreasing wastage; investing in sustainable agriculture and freshwater systems. For developing countries, in particular, finance may be needed to increase agricultural investment in infrastructure for value addition and to reduce water transmission losses in irrigation canals and other water systems. Finance is also needed to improve storage and water quality, and for investing in hard infrastructure, such as dams, to protect current assets at risk, when economically efficient to do so, and devise retrenchment strategies for other cases. Infrastructure development must take into account the impacts on water quantity and water quality, biodiversity, energy and resource efficiency. Finance is also essential for water resources management, in particular for investing in the institutions and mechanisms needed to allocate water among competing demands in an equitable and sustainable manner.

Investments in protection and improvement of biodiversity

Investments in protection and improvement of biodiversity such as upper basin management protection and wetland and forest restoration, when it is cost-effective for achieving water policy targets. Governments are encouraged to consider ecological infrastructure as one of the top priorities for public spending both in their immediate responses to the current global financial crisis and in their regular national budgets. Investing in ecological infrastructure is important for all countries. Developing economies in particular are home to hundreds of millions of poor people whose livelihoods depend on critical ecosystem services.

Promotion of water technologies

Green technologies have the potential to create new business opportunities and markets, contributing to job creation. This includes cooling methods for energy plants, desalination with wind energy, and changes to drip irrigation. Innovation is a key driver of productivity. It relates to both technological and non-technological approaches, such as integrated environmental strategies, responsible management practice and new business models (such as eco-efficiency).

Annex 2. Issues presented for discussion at the Zaragoza Conference

Issues	Relevant issues for the green economy
Agriculture	Water and food security Improve efficiency and nutrition per drop Improve efficiencies through the food value chain Challenges for small farms in least developed countries
Cities	No excuse MDGs – basic water supply and sanitation services Changes in water consumption patterns in cities (direct and indirect) Improve effectiveness and quality of urban water supply services Reduce externalities of cities to the water environment
Industry	Change production patterns Improve efficiency and reduce pollution Promote innovation Challenges for small and medium companies in least developed countries
Watersheds and aquifers	Scarcity management Climate change and extreme events Transboundary water resources Protection of biodiversity

International Decade for Action 'Water for Life' 2005-2015

A Decade for Water, a Decade for Life

Towards the primary goal of the Water for Life Decade, Spain has agreed to provide resources to the United Nations to establish an Office to support the International Decade for Action. Located in Zaragoza, Spain, and led by the United Nations Department of Economic and Social Affairs (UNDESA), the Office implements the UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC) aiming at sustaining the global attention and political momentum in favour of the water and sanitation agenda at all levels during the Decade.

Economic Commission for Latin America and the Caribbean (ECLAC)

ECLAC, which is headquartered in Santiago, Chile, is one of the five regional commissions of the United Nations. Its purpose is to contribute towards the economic and social development of Latin America and the Caribbean, coordinating actions directed towards this end, and reinforcing economic ties among countries and with other nations of the world. ECLAC also provides advisory services to Governments, and formulates and promotes development cooperation activities and projects of regional and sub-regional scope commensurate with the needs and priorities of the region.

**Compiled by the Economic Commission for Latin America and the Caribbean (ECLAC)
and the UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC)**

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