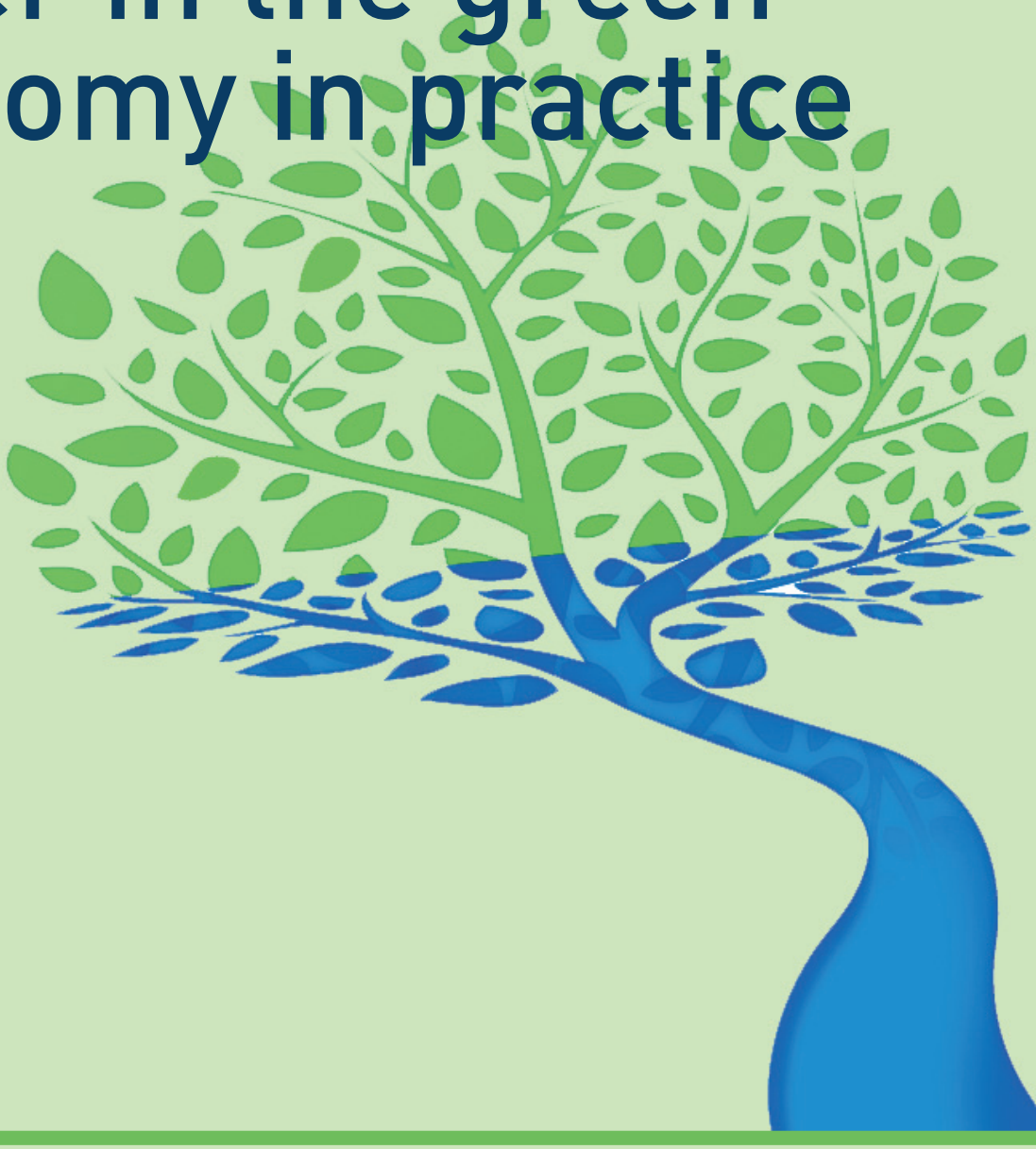
UN WATER

# Chapter 4: Conference summary. Water in the green economy in practice



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# Chapter 4

# Conference summary: Water in the green economy in practice



Content

# Introduction

This document presents a summary of the tools and a synthesis of the plenary sessions of the conference 'Water in the green economy in practice: towards Rio+20'. Each plenary session comprised of an overview presentation made by the session convenor and a questions and answers discussion with the panellists. The panellists represented specific case studies from around the world which demonstrate the successful implementation of the tools. The document concludes with key messages derived from the conference.

**Section 1** presents economic instruments in water management. This session of the conference was convened by Gerard Bonnis (OECD) and his overview presentation was followed by a discussion with the four invited panellists: Thinus Basson from South Africa; Sinaia Netanyahu (Ministry of Environmental Protection) and Mo Provizor (Israeli Water Authority) from Israel; and James Horne (member of the Australian Water Information Advisory Committee) from Australia.

**Section 2** turns to the tool 'sustainable financing'. In this session, Maria Angelica Sotomayor from the World Bank presented an overview of sustainable financing. The panellists for the session were: Gayitri Handanahal Venugopal representing a case from India (Naandi Community Water Services), and Thomas Hascoet (Veolia Environment) and Said Chadli (LYDEC) representing a case from Morocco.

**Section 3** focuses on investments for the protection and improvement of biodiversity. Elisa Tonda (UNEP) convened the session and was joined by Batula Awale from Kenya (WWF ESARPO) and Pablo Lloret from Ecuador (FONAG).

**Section 4** presents water technology as a tool to facilitate job creation and the development of enterprises. The session was convened by Karl Ulrich Rudolph (Coordinator of the UNW-DPC Working Group on Capacity Development in Water Efficiency) and his overview presentation was followed by discussion with Dieudonné Sawadogo from Burkina Faso

(ONEA), Hani Sewilam (UNW-DPC) and Rajiv Kumar Gupta from India (Climate Change Department, Government of Gujarat).

**Section 5** is dedicated to the session, 'what reforms for green jobs?' The theme was introduced by Carlos Carrión-Crespo (ILO), followed by a panel discussion with Roel Espiritu from the Philippines (Maynilad Water Services) and Vicenta Trotman Vargas from Panama (Management Board or the Rural Aqueduct in Kusapín).

**Section 6** summarises the session on water planning. The session was convened by Manuel Omedas Margelí (CHE) and the invited panellists were: Oudomsack Philavong from Lao PDR (Ministry of Natural Resources and the Environment) and Yoon-Jung Cha from Korea (Office of National River Restoration).

**Section 7** discusses the importance of context in the implementation of the tools and draws on lessons from the conference sessions on the Latin America and Caribbean region (convened by Caridad Canales Dávila, ECLAC) and the Western Asian region (convened by Mohamed Al-Hamdi, ESCWA).

# 1. Economic instruments for water management in the transition towards the green economy

## Setting the scene: water security and green growth

Water is essential for sustainable development. International evidence demonstrates how water scarcity, floods and the lack of basic water and sanitation services and infrastructures can be an impediment to economic growth and also lead to environmental deterioration, deprivation and social inequality. However, even in the most extreme of the situations, opportunities do exist to make sustainable water management an integral part of a development strategy, helping to break the poverty trap in least developed countries, fostering the economic transition in middle income countries, and improving efficiency and sustaining long-term economic and social progress in all countries.

> ***"The lack of sufficient quantities of adequate quality water can significantly hinder growth. At the same time, water can be an engine of growth: improved water management can generate huge benefits for health, agriculture, and industrial production."***
>
> **Gerard Bonnis, OECD**

Overall the water security outlook is a source of concern. According to OECD, a 55% increase in global water use is projected between 2000 and 2050. By 2050 nearly half of the world population will live in severe water stressed areas. This is in addition to worsening trends in water quality deterioration, the uncertainties imposed by climate change and the occurrence of extreme events such as floods and droughts.

In the green economy, the main role of water development is to catalyse economic growth and social development "while ensuring that natural assets continue to provide the resources and ecosystems services on which our wellbeing relies" (OECD, 2011). The challenges and opportunities for water development are in practice very context specific, dictated by many factors including the relative abundance and quality of the water resources, the social and political priorities, and the institutions in place.

## Economic instruments and water policy goals

There is an ample array of economic instruments that can be implemented to advance wider development policy goals. For example, marginal social cost pricing is a means to incorporate the scarcity value of water. This can signal when is best to invest in water infrastructure so that water supply is augmented and the mix of different conventional and alternative water sources is optimised. Water markets can enable stakeholders and water users to find mutually beneficial agreements and can incentivise investments to enhance water efficiency. Emission taxes can be designed for reducing pollution and effluents but emission permit trading can allow the same outcome to be achieved and at the lowest cost source. Subsidies can also be effective means to promote the development of multipurpose infrastructure with important economies of scale, and to facilitate access to basic water services when the ability to pay for those services is lower than the provision cost. The selection of the particular instrument to be implemented and developed depends on many context specific factors including the institutions in place, the definition of water property rights, the transactions costs involved, the available information and the ability to enforce and implement any instrument in a transparent way.

The selection of the particular economic instrument to be implemented depends on many context specific factors

The transition to a green economy may demand the increasing use of economic instruments as part of the policy toolbox for water management. The reason is simple: when properly designed and implemented they are means to adapt individual decisions to desired policy goals. For example, water trading can be a powerful instrument to reallocate scarce water resources to the most beneficial uses. It can allow the increased production of goods and services without further degradation in the water environment or, alternatively, save water that can be used for environmental restoration, without reducing the income or the employment opportunities available for society. Similarly, prices are an instrument to convey signals about water scarcity to the market, incentivise improvements in water efficiency and penalise excess consumption in water scarce areas. Prices can also facilitate the introduction and adoption of alternative water sources, such as treated wastewater or desalinated water.

Economic instruments are part of the water manager's policy toolbox

The different options can be illustrated, for example, by examining the cases of Israel and Australia. In Israel, advances towards cost recovery water prices, increasing block tariffs and universal metering have helped manage severe water scarcity and fostered the innovation, development, and diffusion of water efficient technologies. In Australia, the separation of water use and land property rights and the allowance of water rights trading were key to transitioning from an engineering-based water management approach to one which fosters water use efficiency and is better equipped to cope with water scarcity.

Economic instruments

## Water pricing and command and control for water demand management in cities and agriculture in Israel

Israel provides an example of the successful use of water pricing to manage water demand in a severely water-scarce country. The country has pioneered water-efficient technologies and practically all water consumption is metered. In recent years, the financial burden has been shifted to consumers that pay higher water tariffs. These tariffs reflect cost recovery, the scarcity of resources and the cost of rehabilitating natural assets that have been deteriorated. A 40% increase in water prices in agriculture introduced earlier this year has both reduced water use and encouraged the use of recycled and desalinated water sources for irrigation. Sinaia Netanyahu (Ministry of Environmental Protection) and Mo Provizor (Israeli Water Authority) explained how rising block tariffs in the urban and agricultural sector provide incentives to conserve water resources and develop innovative water management devices to increase efficiencies.

Economic instruments are not ends in themselves but means to an end (e.g. improved economic efficiency, social equity or environmental protection)

By influencing individuals' decisions, economic instruments can be used to incentivise individuals' behaviour in order to meet the goals of the green economy. Economic instruments are not ends in themselves but means to an end. For example, water prices, subsidies and water trading are neither 'right' nor 'wrong' but should be adopted on the basis of their ability to contribute to specific water policy objectives, including targets related to economic efficiency, social equity and environmental preservation.

Having information about the real environmental cost of water or the non-market benefits of preserving it is important for policy making and implementation, especially for deciding on the environmental objectives and allocation decisions in water planning. For the implementation of economic instruments, the information required is that which helps realise existing opportunities for improving water efficiency, and that which reduces transaction, monitoring and enforcement costs. Australia shows how effective mechanisms have been implemented to improve efficiencies in agricultural water use and buy back water for the environment in spite of the capital costs involved and the lack of concrete information on the potential environmental benefits. It is not a prerequisite to have all the information required for comprehensive cost benefit analysis, in order to reach agreement on the need to ensure water is made available for the environment and to effectively implement measures to generate this change.

> ***"I want to highlight the benefits to the environment from having effective markets and establishing water rights for the environment. In most places the environment gets hammered."***
>
> **James Horne, member of the Australian Water Information Advisory Committee**

## Water trading in the Murray-Darling Basin

In Australia an expanding market for the trading of water use rights –90% of which takes place in the Murray-Darling Basin– has enabled water to be allocated efficiently amongst users under conditions of water scarcity. Environmental sustainability is ensured through the purchasing of water rights for the environment. Over a decade of progressive water reform has provided the framework for the country's market based approach, and the case illustrates the lengthy process of setting up the infrastructure necessary for a market. According to James Horne (Member of the Australian Water Information Advisory Committee), there is wide acceptance of the benefits to regional economics and businesses from water trading, as demonstrated during the severe drought 2-3 years ago. Water trading increased significantly, allowing irrigators to respond flexibly to the drought and manage their balance sheets much more effectively.

In the case of Israel, the real objective was to increase water efficiency. In spite of the lack of markets to allocate water to its most beneficial uses (for example in the irrigation sector), water quotas are allocated by the central government and farmers are able to decide how much of these rights to use. Block tariffs which increase with water use have been effective for increasing water efficiency. Farmers pay more for high water use and have incentives to innovate (actually 80% of farmers do not use the third and most expensive part of the quota). Both centralised and decentralised mechanisms to allocate property rights are effective to cope with water scarcity and enhance water security.

The role of water trade and water prices in the South African National Water Resource Strategy differ to the importance given to these instruments in Australia and Israel. Although water scarcity is an important issue in the three countries, in South Africa the focus is on harnessing opportunities to make water an engine of growth, for example through subsidies for the infrastructures to transfer water from one location to another. Based on overall cost benefit analysis of big water works projects subsidies are justified on the basis of economies of scale, multiuser benefits and the provision of public goods, while water trading is restricted to farmers in the same district. The role of incentives is an emerging issue in water management and is expected to play an increasing role in contexts where efficiency is an important goal. In contrast to the South Africa case, very few restrictions remains in place for water trading in the Murray-Darling basin in Australia, and cost recovery pricing is now an integral part of the water culture in Israel.

The role of incentives is an emerging issue in water management

### Subsidies for water infrastructure as an engine of growth in South Africa

South Africa is an arid country and rainfall is highly variable in time and space, with climate change projected to increase variability in water availability even further. Subsidies for key infrastructure have been used as an important tool to realise the potential of water as an engine of growth in South Africa. Infrastructure development has enabled the management of the country's water resources, both by storing water during the wet season for use during the dry and by transporting it from areas of surplus to areas of deficit, and to where the greatest benefits can be achieved.

## The critical role of water institutions

Economic instruments stress the role of institutions for water management. The selection of economic instruments to be implemented in any particular case is a social decision. When the government decides to price or subsidise water use, individuals are able to decide how much water to use or to save. When the government decides on water allocation and/or water trading, a prior decision is required on how much water, from where, for what economic uses and under which conditions, it can be traded. The combination of governments and markets, public institutions and private decisions is essential to guarantee the coherence between individuals' decisions and social objectives in water management.

A combination of governments and markets, public institutions and private decisions is essential to achieve social objectives in water management

Economic instruments that provide incentives are not the alternative to government regulation and public water management. They may not even be an option where there are no strong public water management institutions or regulators. Water governance and effective water management institutions are pre-conditions for the successful implementation of water-related economic instruments. As important as the choice of an instrument is the adequate design required for that instrument to achieve different objectives. For example, regarding prices, flat rates can be useful and effective for recovering the cost of water storage and transport, water supply and sanitation services or even water treatment facilities, but they are not able to provide incentives to influence water saving behaviour as the amount paid does not depend on how and for what purpose water is used. Water markets only work when use rights are properly defined, transactions are controlled, the infrastructures required for the transfer are in place, the potential negative ef-

Economic instruments are not the alternative to government regulation and public water management, and they may not even be an option in the absence of strong public water management institutions

Implementation of economic instruments is a long term adaptive and learning-by-doing process

fects over third parties not involved in the bargain (including the environment) are properly protected, and information and transaction costs are not prohibitive. Implementation of economic instruments is a long term adaptive and learning-by-doing process.

## Economic instruments to improve efficiency in water services and water use

Economic instruments are a good option when efficiency is the key objective of water policy. But these instruments need to be adapted to other water policy goals. In particular, it is important to find ways to address the distributional effects of economic instruments in order to align water management with social development. For example, in Israel, agriculture development have been a key driver of water policy and further advances are limited by the already high marginal costs of reducing water use in that sector. Options available include increasing reliance on cross subsidisation from domestic tariffs and getting funds from the state budget. The same applies to current discussions in South Africa with respect to the potentially regressive effects of using public funds to finance infrastructures to provide water for economic uses such as irrigation. On the contrary, in the case of Colombia, cross-subsidies have been designed and successfully implemented to increase water efficiency, increase access to drinking water, subsidise the poor and guarantee the overall financial viability of the water provisioning system.

It is important to find ways to address the distributional effects of economic instruments in order to align water management with social development

Economic incentives for water need to be aligned with sectoral policies (e.g. agriculture, energy, climate change, environment). The demand for water by users responds to incentives in many different domains such as energy subsidies, the subsidies for crop-production, and the tariff and non-tariff trade barriers still existing especially in developed countries. In the case of South Africa, the elimination of those barriers is recognised as an important driver to reduce water scarcity and improve water security while supporting development opportunities in less water scarce neighbouring countries. Energy subsidies can make a real contribution to reducing groundwater depletion and promoting the adoption of more efficient irrigation techniques.

Water demand responds to incentives in different domains such as energy subsidies and subsidies for crop-production

## Economic instruments and building water governance

Economic instruments can contribute to improving water governance. Even when they are not finally implemented, they can serve to raise public awareness of water challenges, sending signals about their importance and the need for political com-

mitment to tackle them. This was the case in Israel with the introduction of a higher tariff block –the 'over consumption tax'– in 2009, proposed to encourage water use reduction for large consumers in severe drought periods, and abandoned due to social protest. In spite of its failure, the debate it provoked served to increase public recognition of the problem and the need to find alternative solutions. Moreover, it drew attention to the importance of water conservation and demonstrated to the public the political commitment to addressing the country's water challenges.

Water trading develops as part of the evolving progress in water governance. In the early stages of water trading the number of transactions is limited by the high bargaining costs, the little information available, and the important concerns about equity, third party and environmental impacts. Advances are linked to adapted regulations, better defined property rights, public and improved information systems, more effective bargaining and transparent discussions. When successful, the whole process is supported by the evidence of the benefits delivered, not only for those involved in the trading, but for the entire society in terms of water security and improved natural resources (as in Australia were water trading is perceived as a fair and effective mean to adapt to droughts and to protect farmers). All this allows for the progressive removal of barriers for further trading, enhancing the benefits of water allocation. More advanced markets might even open the possibility, as in Australia, of introducing the environment as a formal water user through the buy-back of water use rights to return water to the environment.

# 2. Financing water development in a green economy

A green economy requires increasing investments in preserving natural capital – the ecosystems providing water and other services such as nutrient recycling, waste removal and flood protection. Investments are also needed in the physical capital and technology that enables the provision of water services to meet basic human needs, for food and energy production, and for the production of many goods and services in the economy.

## Challenges and opportunities

The transition towards a green economy demands significant financial resources. According to UNEP, US$ 191 billion per year until 2030 and US$311 billion through to 2050 are required only for investments in water and sanitation services. The fact that investing in water and sanitation makes good economic sense is well recognised and the overall benefits in terms of health, education opportunities and the unlocked potential for economic and social development are greater than the cost of the financial resources required. Nevertheless, mobilising these resources and finding adequate institutional arrangements to utilise them effectively and sustainably is still a major challenge in developing countries.

> *"It's not so important to focus on the amount of investment needed for water, but how we can make the most of what we've got"*
>
> **Maria Angelica Sotomayor, World Bank**

Mobilising financial resources and finding adequate institutional arrangement to utilise them effectively and sustainable is still a major challenge in developing countries

It is essential to improve efficiencies in the use of funds in order to make better use of the scarce financial resources available

It is essential to improve efficiencies in the use of funds in order to make better use of the scarce financial resources available. This will help attract additional funding and increase cost recovery. A major challenge is that increased investments do not always result in improved access to sustainable water services. For example, some financial resources intended for investment in water may not end up being used for this purpose due to political reasons. Moreover, those resources that are effectively invested may deliver fewer benefits than expected when used inefficiently by public firms or improperly regulated utilities.

## Barriers to sustainable financing

Breaking the vicious circle of low investments leading to poverty and low savings is one of the main financial challenges that need to be overcome in the transition to a green economy

There are a number of barriers to funding water development, especially in least developed countries. Poor countries lack proper credit and insurance markets. Service providers have poor access to finance and everywhere credit access is limited for small firms and practically non-existent for the poor. In their early stages, water projects are associated with higher risks, especially when they are intended to provide services for the poor. Existing designs and technical options are more appropriate for advanced countries and large scale investments; there are fewer incentives for developing solutions better adapted to the conditions in least developed countries and small scale projects. Furthermore, in least developed countries low income results in low total saving and low investment capabilities. Breaking the vicious circle of low investments leading to poverty and low savings is one of the main financial challenges that need to be overcome in the transition to a green economy.

Most of the benefits of water investments are not visible or cannot be converted into financial revenues to enable immediate repayment of the cost of the water and sanitation services. In least developed countries, benefits are mostly accrued from improvements to health, education opportunities and the freeing of time to pursue opportunities for economic development. Repaying the initial capital costs of water development and generating the revenues to maintain water infrastructures and natural capital in the long term is only possible if those development opportunities are successfully taken, personal incomes increase, and the economy is able to sustain its own water assets and services.

Generating revenue through tariffs is often difficult for some investments (including those related to sanitation, pollution treatment and abatement, improvement of biodiversity and in some cases from the provision of basic services to the poor). Tariffs are a possibility for

water provision for drinking and irrigation, but not for flood control, ensuring water security, nutrient treatment, navigation or biodiversity improvements. In these cases benefits are collective but costs still need to be paid somehow. The key policy question is how to share the costs of water development between governments, services providers and users, and how the cost sharing should change over time.

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### Pro-poor financing and tariffs in Medellin, Colombia

Empresas Públicas de Medellín, a service provider owned by the Municipality of Medellin have designed a number of programmes aimed to increase water services coverage, improve efficiencies, and target low-income households and peri-urban areas. These include a programme offering long-term credit at low rates to low income populations for construction of water and sanitation networks and connections to public utilities; a programme providing people with low payment capacity and bill debts access to low cost financing; a programme offering credit at competitive rates for home improvements and efficient appliances; contracting small community organisations for work related to water and sanitation services provision; and provision of public water services to peri-urban areas.

At the national level, a subsidies scheme offers low income users subsidies financed by an overquote in the bills of high income users, industrial and commercial users, and with municipality funds. Full cost pricing has ensured the financial sustainability of water utilities, reducing their dependence on budget allocations.

## Lessons learnt from implementation

A central lesson can be drawn from the implementation of effective funding and cost recovery mechanisms: improvements in the use of public funds and efficiency gains in service provision are mutually reinforcing and essential for driving forward sustainable financing. These improvements help strengthen political will, make a better case for public investment in water, make more financial resources available for targeting the poor, increase willingness to pay, help attract other sources of funding and reduce reliance on public funds.

Improvements in the use of public funds and efficiency gains in service provision are mutually reinforcing and essential for driving forward sustainable financing

Institutions can do much to facilitate financing and investments. Governments can support institutional arrangements that establish clear and stable norms,

create predictable economic and policy environments, and those that have competent and independent regulatory bodies. These institutional conditions are essential for attracting foreign funds and skills to complement local capacities, and for securing long-term funding and reducing risk premiums.

> ***"It's not just about financing. We need political will to provide access to basic services for deprived populations"***
>
> **Thomas Hascoet, Veolia Environment**

**Good quality services combined with economic progress are the means to increase the willingness and the ability to pay for water services and management**

Public funds, used transparently and efficiently, can provide the initial push in a self-reinforcing process of water infrastructure development. The benefits derived from building critical water infrastructures and targeting the poor are what makes water a cornerstone of sustainable development. Once water services are in place, incentives must drive efficiency gains. Not only do efficiency gains make business sense because they reduce provision costs; they also help expand water coverage and improve the quality of the service. Good quality services combined with economic progress are the means to increase the willingness and the ability to pay for water services and management. Financial sustainability makes water utilities solvent, socially responsible and creditworthy, enabling them to maintain and expand service provision without the need for public funds.

The entire process by which water services become financially sustainable is driven by efficiency gains. This includes improving technical efficiency, for example by reducing non-revenue water and energy consumption. Significant benefits are also expected from reducing managerial inefficiencies, such as those derived from corruption, rent seeking, wrong pricing signals, and so on. Sectoral inefficiencies arise when public policy objectives in policy domains such as agriculture, energy, land use or manufacturing are not coordinated and generate demands that exceed the sustainable provision of water services. Other inefficiencies that can be addressed include those related to transparency, the rule of law and the investment climate.

Sustainable financing is one of the outcomes of better and more efficient water governance. There are a number of policy reforms and instruments that can be used to accelerate the transition. For example, public expenditure reviews (PER), can be used to assess the efficiency, effectiveness and equity of public budget allocations. A sector-focused PER that links spending to outcomes can increase political will and increase support for water investments. The use of incentives to foster efficiency, as mentioned in the previous section on economic instruments, the

> **"Public expenditure reviews can be an important advocacy tool. The minister of finance will be more willing to allocate funds for water if it can be shown they will be used wisely."**
>
> **Maria Angelica Sotomayor, World Bank**

**A sector-focused PER that links spending to outcomes can increase political will and increase support for water investments**

promotion of social dialogue to enhance cooperation, and the use of water planning to coordinate sectoral policies and agree on water conservation targets are all instruments that increase efficiency and improve the outlook for water financing.

## Financing water in a green economy

Some innovative approaches are helping to overcome the barriers to sustainable financing. Result-Based Financing (RBF) provides incentives to beneficiaries to control their own service performance. Providers do not receive funds based on traditional input-based criteria such as of infrastructure or expenditure, but on the verified delivery of the services of a given quality. RBF incentivises service provision, secures the revenues and helps providers obtain the financial resources in advance. It rewards rapid delivery of the service, and is a way to share the risk between the public and the private sector. There are a variety of types of RBF schemes, including Output-Based Aid, social contracts and other formulae of pro-poor financing.

The use of RBF, instead of input-based schemes, is an effective means to bring the focus on the effective delivery of water services. It can facilitate cooperation and dialogue between operators, local authorities and water users and encourages the use of independent technical bodies to monitor progress. Advances in existing schemes can make public financing unnecessary as tariffs can be set at a satisfactory level for both firms and customers (as in Morocco where firms are able to provide new connections without asking for

### Output-based aid: extending water and sanitation services to the poor in peri-urban Morocco

In the poor suburbs of major cities in Morocco, water operators have invested in the much needed expansion of water and sanitation services in these areas through an output-based aid scheme. Operators pre-financed expansion of services and a pre-agreed output-based aid subsidy was disbursed once outputs were achieved – 60% upon a functioning household connection and 40% upon 6 months of service, independently verified. The subsidy allowed for reduced connection fees, bridging the gap between capacity to pay and actual cost of connection. Said Chadi (LYDEC) said some of the challenges encountered in Casablanca were illegal settlements with land title problems; people previously without rights to access water services; coordination between donors, government and other stakeholders; and the financial requirements. Thomas Hascoet (Veolia Environment) emphasised the importance of political will, pointing out that the government has to be strongly motivated to extend coverage to deprived populations: *"providing access to these kind of districts legitimises them and gives them right to be there – we can't do this without the political go-ahead".*

a public subsidy). Evidence from the application of RBF mechanisms in the water services sector shows that the well-known barriers impeding the implementation of costs recovery tariffs can be overcome by improvements in water governance and in the efficient and sustainable provision of water services.

Efforts to advance towards sustainable financing must be maintained in the long term and may be incompatible with short-term political goals. Financing the services once connections are made is still a challenge in the countries that have already implemented RBF schemes. There is also a financial gap to enable the extension of existing projects to connect more families. Innovative financial schemes may be difficult to implement if they conflict with existing institutions. There is still a great potential for increasing management efficiencies in the public by defining and enforcing clear and transparent regulations.

Water consumption rises when services are improved and provided on household premises, which poses new challenges, especially in water scarce countries (as shown in Morocco and India). A key challenge is fitting these financial schemes into an integrated water resources management framework, which requires institutional development at regional and national levels.

Social contract formulas are an effective means to empower communities to be involved in water management, generate willingness to pay and collect revenues, as highlighted in the case of the Naandi Foundation water treatment plants in India.

### Social contract formulas in rural areas: the India Naandi Foundation water treatment plants

In India, a partnership between an NGO, a private technology provider and communities is delivering low cost drinking water treatment and provision to poor rural households with a community-driven and performance-based approach. As project manager, the Naandi Foundation secures pre-financing and contracts a private technology provider to build the UV filter water treatment plant and undertake operation and maintenance for eight years. The community provides land, a water source, a financial contribution (20% of capital cost) and a pre-agreed electricity tariff. Naandi develops education and awareness campaigns on water use and health, mobilizes the community to raise their financial contribution and collects water user fees. A performance-based donor subsidy is paid to Naandi upon the delivery of pre-agreed outputs which include three months of billed water services. Gayitri Handanahal Venugopal (Naandi Community Water Services) explained that it was a real challenge to generate willingness to pay and comprehensive education and awareness-raising campaigns were important for this purpose.

# 3. Investing in natural capital to promote the green economy

The proper recognition and valuing of the services provided by ecosystems is a central requirement for a greener economy. Watersheds provide services that are critical for sustaining human life, economies and human welfare.

The capacity of watersheds to support human welfare depends on their state of conservation. Humans exert many pressures on the world's rivers, watersheds and aquifers– for example, through effluent discharges, physical modifications for navigation and flood control, and the abstraction, diversion, and impoundment of water. All of these affect the ability of watersheds to continue providing environmental services. Ecosystem degradation and growing resource scarcities are accompanied with rising costs of replacing the services lost.

The proper recognition and valuing of the services provided by ecosystems is a central requirement for a greener economy

Ecosystem degradation and growing resource scarcities are accompanied with rising costs of replacing the services lost

## Investing in natural capital

Markets recognise the importance of some of the services of natural ecosystems, mainly those that can be converted into commodities that can be traded in formal markets (such as crops, timber or electricity). Markets can reflect the value of benefits obtained from using water or the financial cost of capital and maintenance of water and sanitation services (e.g. the use of channels, irrigation devices, distribution networks or hydropower turbines). However, the opportunity costs of the detrimental impacts of these interventions (negative externalities) have been largely neglected and because of that there has been a failure to allocate water to its most beneficial uses. The

limited recognition of the value of water and ecosystem services in decision-making has led to the overabstraction of water and systemic environmental degradation. Some water provisioning services have been prioritised at the expense of others, and the importance of preserving the structure and proper functioning of whole watersheds has been neglected. Some important services that were previously provided by nature can now only be obtained via costly artificial means. For example, wastewater treatment plants substitute the natural filtration and treatment services provided by well functioning freshwater systems; expensive new technologies regenerate or desalinate water to replace dwindling freshwater supplies; and expensive large infrastructure, such as dams, help prevent floods that were previously controlled by healthy floodplains.

The water that people, economies and ecosystems all depend upon is provided by a combination of natural capital and human made capital. Traditional decisions on water use have favoured investment in physical capital over the conservation of natural capital. A green economy implies finding a way to restore the balance, fully recognising and incorporating the value of the earth's natural capital. Restoring water-providing ecosystems is essential not only for improving biodiversity and the state of the environment, but for achieving water security for people and ensuring the sustainability of the economy in the long term.

## Focus on Payment for Ecosystem Services

In order to improve decisions around water use and conservation, it is essential to make explicit the hidden and less evident costs and benefits involved. Payment for Ecosystem Services (PES) provides a means to internalise the hidden benefits and costs of water use and water conservation, and a tool for financing watershed protection and conservation.

**Payment for Ecosystem Services (PES) provides a means to internalise the hidden benefits and costs of water use and water conservation**

Broadly defined, PES is a payment arrangement whereby beneficiaries of ecosystem services –typically those in cities downstream– pay those who engage in activities to secure the sustainable provision of those ecosystem services. Buyers and sellers will only engage in a PES scheme if it is of mutual benefit for both parties. The emergence of PES is therefore evidence of the benefits that can be derived from coordinating individuals' actions to conserve watersheds and restore natural capital. PES is both a social arrangement to invest in natural capital and a means to agree on the distribution of the benefits from enhanced ecosystem services. It is an effective means to build a common understanding of the importance of preserving water resources.

**Building trust and a spirit of partnership or mutual 'buy-in' amongst stakeholders is key to the implementation of PES**

There are some barriers that need to be overcome for successful PES implementation. Building even a basic agreement implies significant bargaining and transaction costs. For this reason the implementation of PES must be seen as a learning-by-doing process. For example, once a pilot project has demonstrated the mutual benefits of the arrangement, information costs are reduced, the willing-

ness to engage is reinforced, the implementation costs are lowered and the negotiation between sellers and buyers is easier. Start small, scale up and replicate is an adaptive strategy allows feedbacks through social learning. Building trust and a spirit of partnership or mutual 'buy-in' amongst stakeholders is also key to the implementation of PES.

### FONAG – the Fund for the Protection of Water, Ecuador

FONAG is a private trust fund through which water users in Quito Metropolitan District can support watershed conservation and management activities to protect their supply of water. The Fund constitutes a Payment for Environmental Services scheme and local water users, including hydropower and water supply companies contribute regularly under a self-taxing arrangement. Revenues (interest and investments) derived from the equity of the fund are used to finance activities aimed at conserving the basins that supply the water resources. Activities include land purchase in critical areas to sustain ecosystem services and improvement of agricultural management practices, but no direct payments to farmers. Pablo Lloret from FONAG pointed out that the fund was set up for 80 years, and that this long-term vision has been critical to its success. They worked hard to raise awareness of the need for water conservation in order to galvanise support for the scheme.

## PES lessons, challenges and opportunities

The successful implementation of PES schemes around the world demonstrate that changes in land use practices can contribute to the restoration and conservation of watersheds. These changes can be achieved by paying farmers in an equitable manner, providing a means to improve their livelihoods whilst ensuring the sustainability of all water use in the catchment. However, it is important to underline that PES is not a panacea for a number of reasons:

> ***"The identification of a PES scheme that is appropriate in a given context requires careful design, with due attention to the legislative and governance framework"***
>
> **Elisa Tonda, UNEP**

- Innovative institutional arrangements such as PES may in some cases conflict with existing policy and legal frameworks. For example, in some countries PES may not be an option because farmers are already obliged to adopt good management practice and environmental protection by law. PES has typically been easier to implement in countries with lower legal or governmental constraints to converting environmental services into a commercial agreement; something which is not always possible in those countries with more developed water institutions.

- Internalising the value of ecosystems services in costs of providing water and sanitation services means, at least in the short term, higher water tariffs for drinking and irrigation water. This may not always be easy to implement, especially in poor communities presenting an additional challenge for PES implementation.

- Effective PES schemes are often based on expensive technical and socio economic studies. PES will only work when there is enough evidence that improvements in ecosystem services are the result of actions taken by those who are being rewarded for ecosystem conservation. This implies having a good assessment of baseline conditions and an adequate monitoring system in place to demonstrate changes in land use and improvements in water quantity and quality. Information, monitoring and enforcement costs can be expensive or unaffordable.

PES requires having a good assessment of baseline conditions and an adequate monitoring system in place to demonstrate changes in land use and improvements in water quantity and quality

- Determining a fair payment is a key challenge in PES. Commonly, the group of stakeholders eligible to receive payment in a PES scheme is not homogeneous and it is impossible to measure individual contributions. In this situation, determining a fair and equitable distribution of payments is a challenge and wrongly made decisions can undermine the functioning of the whole scheme. This challenge can be complicated by the fact that a significant portion of the benefits obtained –for example from fodder production and soil conservation when a right balance is found between pastures, crops and livestock upstream– accrue directly in the form of higher productivity and improved livelihoods of those contributing to the provision of ecosystem services. Furthermore, the

> ***"Image can be an important motivator to get buyers from the private sector on board, as they want to be associated with good environmental practice"***
>
> **Batula Awale, WWF**

## Payment for Environmental Services pilot project in Lake Naivasha basin, Kenya

In a pilot PES project in Lake Naivasha basin, the local water resources users association formed mainly of flower and vegetable growers, compensates upstream small-scale landowners for managing their land to provide good quality water to downstream users. The scheme has reduced environmental threats as well as provided income and livelihood improvements for participating communities. Batula Awale from WWF, one of the implementing agencies, outlined a number factors that were critical to the success of the project. She highlighted the merit of a simple approach. Although complex hydrological and technical studies were undertaken, in order to facilitate communication and negotiation with the sellers and buyers, the PES concept was simplified and technical detail was avoided. Seller and buyers were already organised into well-established groups –water users associations– which made it easier to initiate the project. The success of the project was also underlain by a strong partnership of trust between buyers, sellers and the government, and a strong and progressive vision for promoting the sustainability of Lake Naivasha basin.

problem of free riding arises when certain people benefit from the services provided, without paying or being part of the PES scheme.

- PES can be a very effective tool when environmental services can be valued and when all the suppliers and beneficiaries take part in the agreement. However, some environmental services are difficult to value, such as the maintenance of species without a commercial use or resilience to climate change. Furthermore, some beneficiaries cannot easily be brought to the negotiation, such as future generations or stakeholders not living in the basin.

PES can be a very effective tool when environmental services can be valued and when all the suppliers and beneficiaries take part in the agreement

Despite the challenges to implementing PES, it is increasingly being used as a tool to promote investment in natural capital and has successfully created incentives for achieving sustainable development goals. Lessons learnt from implementing pilot projects will make easier transfer the tool to new areas and contexts.

### Payment for Ecosystem Services in Peru

A PES scheme has been implemented by the Moyobabma water utility in the San Martin region, with the support of NGOs and the GIZ. The scheme was designed to address the threats to water quantity and quality due to erosion caused by deforestation in the upper reaches of the river basin. In the scheme, urban water users finance the conservation and recovery of hydrological environmental services through compensation to farmers and direct funding of reforesting, conservation activities and monitoring in the area. Farmers are compensated through training and technical assistance for agroforestry and with small infrastructure such as wells and latrines.

### Rewards for watershed services in Sumberjaya, Indonesia

The 'Rewards for Use of, and shared investment in Pro-poor Environmental Services' (RUPES) project in Asia, facilitated the design and implementation of environmental services rewards schemes in Sumberjaya. The initiative was based on rigorous research and modelling of the impacts of coffee farming on erosion and sedimentation to generate evidence of the relations between land use and watershed functions. RUPES comprised of three programs: the Community Forestry Program (HKm), providing farmers with conditional land tenure for forest protection; the Rive Care Program wherein a hydropower company finances activities which improve water quality through sedimentation reduction; and a Soil Conservation Program which pays farmers for reducing erosion and sedimentation. In all three programmes, local people directly benefit from higher yields in the multi-strata coffee production system and cash payments from soil erosion control and sediment reduction. The payments also represent an increment in household incomes.

# 4. Technology to facilitate the transition to a green economy

Technological development, adaptation and adoption to support sustainable development is a key element of the transition towards a green economy. Innovation incentives, technological choices, and diffusion processes are all important to foster the transition. There will be business and job opportunities associated with technologies which enhance efficiencies in water use, water utilities and infrastructures, resulting in the creation of green jobs and demanding investment in new green skills.

Innovation incentives, technological choices, and diffusion processes are all important to foster the transition to a green economy

## Fostering the technological shift

Water challenges and the technical solutions to address them are dependent on many regional and even local (river basin) factors. Unlike energy, the provision of water services relies on the capacity of local watersheds and infrastructures. Water is also very difficult to transport across long distances. For these reasons, water challenges and opportunities are very local and depend on the specific characteristics of a watershed and on local supply and demand of water.

Advances in technology are essential to reconcile increasing water demand with the capacity of physical and natural capital to supply the water required to sustain development and economic growth. Effective technology adoption, supported by adequate water governance, is one cornerstone in the transition to a green economy. As human pressures on water resources increase, the abundance of available supplies declines and the relative value of water increases. These trends must be accompanied by progressive technical advances, from conventional technologies when water is

Innovative water technologies can help close the increasing gap between water supply and demand

> *The green economy needs entrepreneurship and innovation, and this should start at school.*

**Hani Sewilam, UNW-DPC**

relatively abundant, to alternative sources of water, such as treated water, rain-harvesting or desalination when water is scarce. At the same time, technologies are required to increase efficiencies in the provision of water supply and sanitation services and in water use.

### Improvement in water supply through a GIS-based monitoring and control system for water loss reduction

In Ouagadougou, Burkina Faso, a GIS-based monitoring and control system has enabled significant reductions in water losses within the distribution of a municipal utility. The technical components include leak detection devices, pressure and flow control sensors with real-time and online data transmission, automated pressure valves, and an intelligent GIS-based computerised system to steer the whole process. Local jobs were created through the investment in and continuous operations of the water loss reduction programme. The programme also improved water efficiency, water supply and customer awareness of the importance of protecting water resources and caring for public water supply property. Dieudonné Sawadogo (ONEA) revealed that strong partnership and the determination of the utility to address water loss reduction drove the implementation of the programme. He also highlighted the importance of training to build the capacity of local staff to operate and maintain the system.

## Incentives for technology

Improvements in the efficiency of water use, water utilities, and water supply systems in agriculture are already possible if the best existing technologies are implemented. But these technologies will only be applied on a large scale if they make business sense, i.e. if the economic incentives are in place. The adoption of greener technologies is not only impeded by lock in effects of outdated technologies and product standards, but also in some cases by the low water and energy prices that, for example, still act as an incentive to use old water irrigation systems and inefficient drinking water distribution networks. Advances in the use of economic instruments, water pricing and payment

> *Appropriate technology transfer is essential. Many times we have seen donor money go to large scale projects which then fail.*

**Mohamed Al-Hamdi, ESCWA**

Eliminating subsidies in water using activities can be an important incentive for technology innovation and adoption of green technologies

for ecosystems services are thus important elements that can help foster the implementation of existing efficient technologies. Eliminating subsidies in water using activities can also be an important incentive for technological innovation and adoption of green technologies, helping accelerate the transition towards a green economy.

## Harnessing technology opportunities: not even a technical problem

Institutions can provide enabling conditions for the adoption of existing technologies and ensure that sustainability is a driver of research, development and innovation. The water sector is States guaranteed. Although not always publicly owned, utilities around the world depend on publicly defined environmental standards. How these standards are defined and enforced determines which technologies are chosen, especially for drinking water provision and wastewater treatment. Many decisions on technology choice, quality of service offered and day-to-day business procedures are prescribed by public regulations (e.g. beneficiaries do not decide on the level of wastewater treatment or the quality of water they receive). However, these regulations do not always facilitate choices in favour of sustainable technologies or foster innovation and early adoption of innovative options. The water sector has many characteristics of a natural monopoly and prices are often defined by limited cost recovery and social criteria decided at a political level.

**Regulation of the market determines whether there will be green or non-green technology development**

In least developed countries, technology choices can be shaped by the way in which infrastructure or water and sanitation services are financed. Water development supported by international assistance can come with specific technologies that may not be well adapted to the scale of the market or local skills in the receiving country. The capacity of the beneficiaries of a technology to sustain its operations in the long term should be a critical consideration in technology choice. Moreover, choosing among available technologies and adapting them to the local conditions must be the result of local decision-making. International donors can have a role in supporting this decision-making process by providing reliable information about the advantages and disadvantages of different options.

**Choosing among available technologies and adapting them to the local conditions must be the result of local decision-making**

There have been promising advances in the search for innovative solutions that are better adapted to the conditions of developing countries. There are examples of small, land- and labour-intensive wastewater treatment plants or even individual devices (such as land extensive water treatment systems or the Peepoo in Kenya), that have proven to be better adapted, more reliable and more profitable solutions in poor countries than the capital intensive water treatment plants that are common in developed countries. In developing and water scarce countries small water harvesting devices for irrigation are another example of appropriate technologies.

Least developed countries might adopt technologies that have not and are unlikely to ever be used in developed countries. In their pursuit of social and economic progress, developing countries are not obliged to follow the same technological path of developed countries. One of the advantages of being a late developer is having the ability to leapfrog and avoid making the same mistakes and encountering the water problems found in the developed world. This is technologically possible but is still an institutional and governance challenge. The experience with information and communication technologies highlights the capacity of poor countries and poor communities to jump ahead in the technological development process, provided the political will and proper governance are in place. Technologies can also help in coping with water problems when water governance fails. For example, remote online monitoring of water effluents offers an alternative when water authorities are unable to monitor effluents and enforce water regulations.

**Technology can enable developing countries to leapfrog ahead and avoid making the same mistakes as developed counties**

### Web-based system for water and environmental studies in the Middle East and North Africa (MENA) region

A web-based system for interdisciplinary water and environmental studies initiated by a partnership of institutions from Germany and Egypt demonstrates how specially designed eLearning tools and knowledge transfer can support an evolving market for green jobs. The learning management system used a 'blending learning technique' and covered topics which ranged from water loss reduction and environmental impact assessment, to modelling and IWRM. The initiative promotes technology innovation in universities, builds capacity and knowledge on environmental issues, and fosters green entrepreneurship. Hanni Sewilam (UNW-DPC) argued that targeting schools and younger professionals helps drive sustainability by changing the mindsets of the next generation.

International cooperation in research and development (through R&D networks) and local initiatives (through the creation of technological clusters) can make real contributions to the innovation, development, adoption and diffusion of green technologies. The ZINNAE (Zaragoza Urban Cluster for Efficient Water Use) case in Zaragoza provides a good example of this type of initiative.

## ZINNAE: Zaragoza Urban Cluster for Efficient Water Use

The objective of the Urban Cluster for the Efficient Use of Water in Zaragoza (ZINNAE) is to promote efficient and sustainable water use and associated energy use in urbanised areas of Zaragoza. ZINNAE facilitates the collaboration of different public and private actors in generating knowledge, implementing demonstrative projects and developing innovative solutions. The vision is to become a leading international example of collaboration, knowledge management and innovation for efficient and sustainable water use in urbanised areas as well as a driver of quality employment for Zaragoza. ZINNAE has an established membership including twenty six public and private entities involved in water management in the urban area.

# 5. Green jobs: greening the labour market to foster sustainability

> ***A green economy can result in job creation, social inclusion and poverty reduction, provided that supportive measures and policies are put in place***
>
> **Carlos Carrión-Crespo, ILO**

The transition to the green economy entails a major structural change. There will be fundamental changes in production patterns of many sectors of the economy, including food production, manufacturing, as well as in water management and in our consumption patterns. The transition will inevitably generate tensions in the labour market. Some skills will become obsolete –and the workers offering them will be redundant in their current areas of expertise– and new skills will be demanded by the transforming economy.

Many of the impacts of the transition, both in developed and less developed countries, can be anticipated. For example, in water, labour demand may increase in activities related to river regeneration, water treatment, basic sanitation and water supply provision, and water demand management, including the production of water saving and metering devices. Other jobs may disappear as UNEP points out in their Green Economy report.

**The transition to the green economy can be managed to minimise negative impacts on workers and to promote a more inclusive and just labour market**

The transition to the green economy can be managed to minimise negative impacts on workers and to promote a more inclusive and just labour market. Two important objectives can be underlined. First, policies must leverage the creation of 'green jobs' which "help reduce negative environmental impact ultimately leading to environmentally, economically and socially sustainable enterprises and economies"[1]. This is not only a means to advance the green economy, but also to mitigate

1. ILO definition, see http://www.ilo.org/empent/units/green-jobs-programme/lang--en/index.htm

the social impacts resulting from the decline of traditional employment opportunities. The challenge is how to align employment and skills development policies with environmental and sectoral policies. This first objective may require making the labour market more flexible and will need to be supported by training and education policy.

**The challenge is how to align employment and skills development policies with environmental and sectoral policies**

Second, the transition to the green economy is an opportunity for the creation of decent jobs – those jobs where workers voices are taken into account and their rights are protected, including their access to social protection.

Social dialogue is a key approach which can be used to agree on pathways for an effective and just transition to a green economy. The setting of transparent participatory mechanisms which involve workers and communities can help reach agreement on a consistent strategy for the transition. Social dialogue can play a key role in tackling the tradeoffs between the different dimensions of sustainability. The tradeoffs between the objectives of employment creation, social justice and environmental protection need to be recognised and agreed upon as all decisions involve advantages and disadvantages. For example, a more flexible labour market is desirable to facilitate the movement of workers from 'brown' to 'green' jobs; but the reforms required must not be made at the expense of reducing labour rights, participation and social protection.

**The setting of transparent participatory mechanisms which involve workers and communities can help reach agreement on a consistent strategy for the transition**

In the same sense, policy options which generate the best environmental outcomes might have a lower potential for job creation. For example, automatic and renewable energy powered trams might be a good option to abate carbon emissions but will entail the loss of many jobs from the traditional transport system in the interim.

Social dialogue is important for coordinating the expansion of other areas where there is potential for job creation and for promoting the skills required in the new labour market. Social dialogue therefore can help workers adapt to the new labour market, reduce social conflict and smooth the transition to a green economy.

**Social dialogue can help workers adapt to the new labour market, reduce social conflict and smooth the transition to a green economy**

## Social dialogue as a means to manage social conflict

Transforming production processes –both in productive sectors and in water utilities– in order to make them more sustainable, raises a number of potential challenges for firms. There can be significant costs involved, as new investments are required and old equipment becomes obsolete. Moreover, the job security of their workers may be threatened as traditional skills become redundant. These changes involved in

the transition may be a significant driver of new conflicts between workers and managers in the firm. However, social dialogue can help address these challenges and manage any conflict that arises. There are successful cases that illustrate the use of social dialogue as a tool for overcoming the many barriers to achieving more sustainable production.

In the case of the Maynilad Water District in Philippines, social dialogue has enabled workers to take active role in a strategy to reduce non-revenue water (mainly water losses), thereby increasing water productivity. The implementation of the strategy was converted into a mutually beneficial arrangement for both workers and the utility, and also resulted in important environmental and social benefits. Social dialogue served to smooth potential conflicts during the privatisation of the water utility and continues to provide a platform for the discussion and resolution of disputes between the management and the unions. Social dialogue enabled the utility to demonstrate their commitment to the protection of water resources, bolstered the reputation of the utility and the dignity of workers, and secured long term financial viability of the firm both by reducing financial risks and increasing revenues and credit facilities.

> ***"A strong partnership between the management, the unions and the employees through active social dialogue has been critical to the success of the business"***
>
> **Roel Espiritu,**
> **Maynilad Water Services**

### Maynilad Water District, the Philippines

Roel Espiritu (Maynilad Water Services) highlighted the importance of partnerships in water services provision in the Maynilad Water District. The management, unions and workers have successfully worked together to reduce the high rate of non-revenue water. The reduction of water losses increases the proportion of water sold relative to the water extracted from nature. This has reduced treatment costs as less water is needed to provide services to the same quantity of customers. The utility has ensured ongoing employment for workers and has also offered workers with new skills and training to implement leak detection strategies. They have also implemented programmes to empower communities to manage their water services and help reduce illegal connections through self-policing.

## Empowerment of communities for managing change

The empowerment of local communities is an important and often the only option for providing basic water and sanitation services in many areas of the world where governments do no reach, for example because settlements are small, poor or scattered in rural areas. The provision of these services is crucial for unlocking the potential for green growth.

**The empowerment of local communities to take an active part in water management is important for making progress in hard-to-reach areas**

The insufficient investment in the provision of basic water and sanitation services can be overcome by engaging and empowering local communities, converting local people into leaders and partners of water development rather than simply customers of a water services utility or beneficiaries of international aid.

Access to water services saves time and labour that can be mobilised for education, food production and income-generating activities, and can therefore help foster economic productivity and social development. The provision of basic sanitation services is a means to improve the quality of the water environment and reaps significant human health benefits. These benefits of providing access to water and sanitation services enhance the quantity and the quality of the labour available for revenue generation and economic progress. Taking advantage of the increased and improved human capital available for economic, social and environmental progress will help foster the transition to a green economy.

Taking advantage of the increased and improved human capital available for economic, social and environmental progress will help foster the transition to a green economy

The empowerment of local communities gives them a voice in choosing among the available options for water and sanitation services and can help prioritise the most appropriate and effective options. The employment intensive investment programme in Panama harnessed opportunities for water provision to generate labour opportunities and entrepreneurship in the local population. The programme supported the development of expertise, skills, and knowledge – not only for the provision of basic water services, but also for monitoring the ecological status of the water resources and the promotion of good sanitation and hygiene practices.

### Employment Intensive Investment Programme, Panama

The programme in Panama has empowered indigenous rural communities to take an active role in water and sanitation services provision. Vicenta Trotman Vargas (Management Board of the Rural Aqueduct in Kusapín) noted that the critical factors underlying the success of water user participation scheme were comprehensive planning and coordination, the involvement of all stakeholders by giving everyone a role, and a strong education component to raise awareness about the importance of water. Specialists in indigenous capacity building built a network of facilitators to promote entrepreneurship, which generates employment and also supports local development.

## Green jobs through investment in natural capital

Labour intensive initiatives to restore water ecosystems do exist and can be successfully implemented with the support of local communities. These types of initiatives can meet dual objectives, by improving degraded water ecosystems and to building local capacities to enable communities to manage their own water resources.

This is the case of the Working for Water Program (WfW) in South Africa, an invasive species management program aimed to restore critical ecosystem services such as the regulation of the hydrological cycle and provision of water services. Clearing invasive plants has significantly increased water supplies. In addition to the training and job opportunities created for the removal of the invasive plants (mainly for women, young and disabled), the program fosters the creation of income-generating activities in poor rural communities, such as charcoal and furniture fabrication.

Labour intensive initiatives to restore water ecosystems do exist and can be successfully implemented with the support of local communities

The Peepoo Project in Kenya illustrates how a small scale sanitation technology can be adapted to the local conditions and generate multiple benefits, including job creation. In this case, the use of the single use, hygienic toilet bag avoids the construction of expensive waste water collection systems and treatment plants. There are benefits both to people's health, environmental benefits from improved groundwater quality, and benefits for agriculture from the conversion of waste into fertilizers. The project fostered employment opportunities and empowerment of women through selling, distribution and collection services.

The collective management of natural resources may become a powerful institutional arrangement to promote sustainable development. Empowerment of local communities and effective participation in resource management can help identify and highlight initiatives that protect the environment whilst fostering economic and social development. For example, the preservation of natural reserves can be converted into a local development strategy rather than being an impediment to the revenue generating activities of the local communities. For this strategy to be successful, it is essential that the improved ecosystems services derived from environmental protection are converted into economic activities such as the tourism services, handicraft production, ecofriendly products, and support services to biological research, thereby multiplying the number and quality of job opportunities. The Community Based Natural Resource Management Program in Namibia is a good example of this type of scheme.

## Governance

Advances towards a green economy cannot be made without simultaneous progress in water governance. Social dialogue, empowerment of local communities, effective and transparent participation in water decisions, community-based resource management, are only some of the institutional arrangements that can be adopted to respond to water management challenges. Social dialogue, for example in the case of Maynilad has enabled stakeholders to reach a mutually profitable agreement around water conservation, with the associated social and environmental benefits, and has enhanced the financial viability of the water sector as well as its potential to create job opportunities.

Advances towards a green economy cannot be made without simultaneous progress in water governance

Community participation, as in Panama, has increased understanding of the importance of preserving water sources. Communities are not only engaged in the provision of basic water and sanitation services, but have also battled to have a voice in decisions on water use for other purposes (as seen in the recent opposition to new mining development projects).

Institutional changes are important driving factors in sustainable development. However, the social processes underpinning institutional change do not necessarily lead to the same institutional outcome. In the case of Maynilad water district in the Philippines, social dialogue played a key role once the utility firm was privatised. In contrast, in Paris and Buenos Aires the public management of water services has been reinstated, accompanied by the creation of new participatory bodies and the reinforcement of citizen control mechanisms.

The devolution of rights and responsibilities for natural resource management to local communities, as in the Community Based Resource Management Program in Namibia, is not only a means to identify the most appropriate development option. It also serves to raise awareness of the benefits of preserving nature, the importance of cooperating instead of competing, and enables communities to reach agreement on the social norms required to apply and enforce the decisions resulting from social dialogue.

# 6. Water planning

Water planning is essential for achieving the triple objectives of economic growth, social justice and environmental protection. All the tools considered in this document can make a contribution to the green economy. However achieving the transition requires a coordinated set of actions, involving the use of all the tools.

Water planning is not only concerned with building the infrastructure necessary to satisfy the increasing water demands stemming from economic and population growth. Water planning is a powerful instrument for realising water's potential to drive economic growth and poverty reduction, and for coping with environmental challenges such as water scarcity or floods.

Water planning has a critical role in less developed countries. In a country's early stages of development, providing access to basic water and sanitation services is of paramount importance for lifting people out of poverty. Water infrastructure planning is also important for supporting productive activities such as agriculture, industry and hydroelectricity. Where water is already scarce, planning needs to consider substantial investments in public works or the development of alternatives sources of water (such as

Achieving the transition to a green economy requires a coordinated and planned set of actions, involving the use of all the tools

> ***"Water planning brings social peace and creates a shared vision. It serves to bring water out of the short-term political game"***
>
> **Manuel Omedas Margelí, CHE**

Water planning is a powerful instrument for realising water's potential to drive economic growth and poverty reduction, and for coping with challenges such as water scarcity or floods

water harvesting or desalination). Climate change is another major challenge for water planning, requiring the development of resilient water management responses.

There are dilemmas to be addressed in the planning process. These include the tension between subsidising water infrastructures and services and sustaining them in the long term, for which self-financing is required.

## The key elements of planning

Water planning is a means to harness development opportunities and cope with environmental challenges. A major objective of water planning is to determine the desired balance between water use and water protection within an integrated water resources management framework.

Successful cases of planning have shown that building governance and institutional capabilities to design and effectively implement long-term integrated water management plans can support green growth. In Lao PDR, this has been part of a progressive strategy for improving water governance, by developing technical abilities, creating river basin management institutions that facilitate sectoral coordination, improving information systems, and promoting stakeholder engagement in the planning processes.

### Water planning in Lao PDR

River basin planning in Lao PDR has been a key instrument for addressing pressures on water resources. The framework focuses on participatory planning and involves cooperation between neighbouring countries that share the Mekong River Basin. Oudomsack Philavong, from the Department of Water Resources of the Ministry of Natural Resources and Environment, stated that basin-wide planning has facilitated coordination between sectors, increasing communication and the joint development of projects. The implementation of well devised plans has led to improvements in water quality and the reduction in flood risk.

Water planning can only contribute to green growth if water is not perceived as a single sector or policy area, as is agricultural, energy or industrial policy. In the transition to the green economy, water planning needs to be converted into a cross-cutting policy, in order to guarantee that all other policies and projects – from urban planning to agricultural policy – are coherent with the collectively agreed objectives of water planning. Water planning enables the coordination and alignment of the many public policies (such as land use, urban and rural development, manufacturing and energy policies) and public policy objectives (such as economic efficiency, equity, basic needs coverage or cost recovery) which influence and are influenced by water management. Water planning makes water policy a horizontal axis connecting and coordinating many individual areas of public action.

**Planning can identify the best way to allocate and use water resources to meet the competing needs of different users and sectors, including environmental requirements**

Global water demand is on the rise due to population growth, rising living standards, and expanding production of agriculture, hydroelectricity, and the many goods and services for which water is an essential input. Water requirements today and in the future cannot be met unless all these uses of water are coordinated and water sources are conserved. Planning can identify how to allocate and use the available water resources to meet the competing needs of different users and sectors, including environmental requirements.

### Water planning in the Ebro River basin, Spain

In the Ebro River basin, water planning and water management have played a central role in economic development, transforming the semiarid region into a prosperous economy. Water planning has enabled the development of the agro food and energy complex that now represents a competitive advantage and a defining characteristic of the Ebro River basin in Spain.

Today, the primary objective for planning is reconciling economic growth with the protection and improvement of the water resources which are critical to sustaining economic welfare in the long term. Setting the achievement of a good or fair ecological status of the water bodies as the main objective of River Basin Management Plans in the European Union has been an important contributor to meeting this objective in the Ebro basin. An extensive public participation network ensures that stakeholders engage through the development of river basin management plans and take part in the decision making process.

Deciding on the objectives for a river basin is a political and not a technical exercise. Identifying trade-offs between different objectives and decision criteria in water management (such as efficiency, fairness, financial and environmental sustainability) is key to the planning process and provides the basis for political decisions to be made over what actions to take. A transparent planning process with stakeholder participation at all stages is essential.

**Deciding on the objectives, priorities and actions for a river basin is a political and not a technical exercise**

Effective water planning requires the cooperation and engagement of a wide range of stakeholders. Public participation helps construct a shared vision of the objectives, opportunities, challenges and collective and individual responsibilities involved in the management of water resources. Water planning is

**Public participation helps construct a shared vision for water management**

the forum for deciding on infrastructure planning, appropriate allocation and level of protection of water resources in the long term, as well as on the required cost-effective combination of measures to achieve sustainable development. Participation can address and manage the many social conflicts associated with the distribution of water amongst individuals, economic uses, time and regions. Planning is a means to promote a common vision of the river basin as a collective asset. Achieving this is dependent on effective participation that fosters the perception of water as a shared asset to be conserved by mutual cooperation rather than a common pool resource to be depleted by open access and competition.

When people are aware of the benefits of cooperation through, they have incentives to build a reputation of good behaviour and social responsibility, fines can be perceived as fair and the threat of moral sanctions can deter misbehaviour. But this collective action can only be based on the common perception that water benefits are distributed fairly. This requires trust that the water authorities represent the common interest and follow transparent rules instead of their own discretion. Cooperation also requires that individual behaviour is observable in such a way that deviations are detected and pay a cost. Building effective participatory water planning therefore requires proper incentives, and must ensure that decisions are perceived as fair, rules are enforced, and there is transparent and adequate information available to all.

> ***"Benefit sharing between different sectors and users is one of the most important outcomes of planning"***
>
> **Oudomsack Philavong, Lao PDR Department of Water Resources**

The objective of planning for green growth is making sustained social improvements and economic growth compatible with the recovery and adequate protection of water providing ecosystems. Instead of adapting water resources to the needs and demands of the economic system, the focus of IWRM is to ensure that economy expansion is not obtained at the expense of further degradation of water providing ecosystems, but on their improvement and adequate protection. Participatory approaches in water planning can be a tool to ensure that water use contributes to the common goal of protecting water resources and achieving a green economy.

Water planning plays an important role in aligning individual decision-making around water with collectively agreed goals. Within limits, any water user has the option to decide how much water to use, for what purpose, in combination with what other inputs. These decisions depend on many factors such as income generated by the productive activity, water prices, and installed water use technologies. For water planning, it is essential that all the decisions taken by water users are compatible with the different objectives of water policy. Incentives and regulations are then an important part of the package of measures in water plans. Charges for water services are one instrument to consider. If, for example, water is charged for with a flat rate, productive uses might have an incentive to use more water than their legally authorised water use rights, neglecting the needs of other downstream users and causing negative environmental impacts. These external impacts are not taken spontaneously into account in private decisions unless there are adequate incentives

in the form of tariffs or penalties, controlled by a regulator. Energy subsidies, yield-linked agricultural subsidies and even water flat fees are all examples of incentives that may not be compatible with the objectives of water plans, including environmental goals. Water planning needs to address the compatibility of incentives transparently, identifying situations where these incentives are justified, and where they are not.

### Water's potential role in supporting a green economy in Barbados

Barbados is a water scarce and densely populated Small Island Developing State. 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, the government initiated a Scoping Study to map out how this vision could be achieved. This initiative continues the trend of Barbadian governments promoting environmentally responsible development through national plans, policies and projects. The study has identified opportunities as well as barriers as a first step to addressing how change can be brought about and the resources necessary. 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. Policy coherence and coordination emerged as an area where more attention is required.

Water planning is the appropriate institutional framework for coping with the challenge of climate change and for developing resilient and adaptive responses to drought, floods and other water related risks. Planning can foster a collective, anticipated and planned approach to responding to climate change and natural disasters. In the absence of effective water planning, individual and uncoordinated responses can exacerbate water scarcity, impair water related ecosystems and increase inequalities and social exclusion.

Poor and water-scarce societies that are now trying to develop their water resources and provide basic water and sanitation services are faced with the potential adverse effects of climate change, constituting a real threat to development[2]. Increasing uncertainty and competition for reliable water supplies makes devising water policy difficult and requires adaptive responses. Water allocation decisions and water demand management are especially crucial in the context of increasing competition and scarcity. Approaches for

2. World Bank (2010). Flowing forward: freshwater ecosystem adaptation to climate change in water resources management and biodiversity conservation. Water Working Notes No.28.

adapting to climate that need to be considered in water planning include no regret strategies such as improvements in efficiencies, and climate justified strategies such as the diversification of water sources and the upgrading of storm water systems.

### The four major rivers restoration project, Korea

In Korea, multiple ministries have joined efforts to design and implement a comprehensive river restoration plan for four major rivers in the country. The plan has multiple objectives, including tackling water scarcity, providing flood control, restoring ecosystems, and fostering regional development through cultural and historical tourism. Yoon-Jung Cha (Office of National River Restoration, Ministry of Land, Transport and Maritime Affairs) highlighted a number of important lessons learnt. There is a need for early investment in sustainable river management, as it is more expensive to correct accumulated problems later down the line. It is critical to cultivate an awareness of the value of water and the need to pay for proper management. Finally, public involvement and participation can reduce social conflict, which will ensure the long-term support and future of the project.

# 7. The importance of context in implementing tools for the green economy: focus on Latin America and the Caribbean and Western Asia

To accelerate progress towards a green economy, it is essential to share experiences and learn from successes (and failures) in the implementation of tools, policies and projects that generate benefits for people, the environment and the economy. However, there is of course no universally applicable model or one-size-fits-all solutions, and the transference of tools and approaches from one location to another must pay due attention to the importance of context.

**The appropriate tool or combination of tools depends on the historical, physical, economic, political, social and institutional characteristics of the country, river basin or community**

The appropriate tool or combination of tools depends on the historical, physical, economic, political, social and institutional characteristics of the country, river basin or community. Different countries and regions face significantly different water challenges and therefore require tailored solutions. Attempts to transfer approaches from one context to another without a good understanding of these differences may hamper progress or even lead to adverse outcomes.

This section examines the Latin America and the Caribbean (LAC) and the Western Asian regions, illustrating how approaches for managing water and providing water and sanitation services depend critically upon local context, institutions and conditions.

## Water challenges in the LAC and Western Asia regions

The LAC region has abundant water resources –a third of the world's total– but its availability varies greatly and inefficient management is a pervasive problem. The region has shown impressive progress and figures show that around 90% of the population now has access to safe drinking water services. However, there are significant

variations between and within countries and almost 40 million people still lack access to safe drinking water and those with basic access often receive a poor quality service. LAC has the most inequitable income distribution in the world and deficits in access to water and sanitation services particularly affect rural areas and low income populations. Aging water infrastructure, insufficient investments and inadequate regulatory frameworks impede progress in this area.

Increased standards of living, rapid urbanisation, and climate change vulnerabilities all pose major challenges for water management and green growth in the LAC region. Water management suffers from a number of problems including institutions with weak or no enforcement capacities, lack of institutional potency to deal with crises, inadequate self-financing mechanisms, lack of reliable information and conflicts between competing water users.

Western Asia is one of the most water scarce regions in the world. There are sharp disparities in the progress towards achieving the water and sanitation MDG targets, particularly between the high-income countries of the Gulf Cooperation Council (GCC) and the LDCs where conflict, lack of finance and political constraints present major obstacles. Coverage is 85% for sanitation and 90% for water, but intermittent water supply means that most people in the region do not receive water services of a sufficient quantity and quality.

How declining supplies are managed to meet growing demand for water has critical implications for economic growth and poverty alleviation in Western Asia. Groundwater is heavily overabstracted and in many countries the opportunities for harvesting surface water have already been taken. Food security is also a major issue and a policy focus on internal agricultural production threatens the sustainability of water resources. Energy and water challenges are intimately linked and energy shortages in some countries restrict their ability to produce and distribute water. Climate change is also projected to have a detrimental impact on water availability.

> ***"All the water challenges you can think of are being faced in Yemen: water scarcity, the country is poor and can't afford desalination, and a difficult terrain means it is expensive to deliver water to the people. Solutions to water scarcity will come from countries like Yemen"***
>
> **Mohamed Al-Hamdi, ESCWA**

## Tools and approaches adopted in the LAC region

In the LAC region, there are opportunities for advancing towards the green economy by enhancing water and energy use efficiency thus reducing environmental pressures and extending access to water supply and sanitation as a tool to fight against poverty.

A mixture of policies and instruments have been adopted in the LAC region, including water planning, financing mechanisms, decentralisation, and economic instruments. Both in Guatemala and Barbados, national planning initiatives have enabled the creation of a shared vision for aligning water resources management with development strategies and environmental goals. Importantly, it is often the combination of tools or approaches which has enabled the desired change. For example, in Barbados, planning processes are com-

bined with a strong political commitment to environmental stewardship, plans for significant investment in the water sector and the implementation of financial and regulatory incentives to promote water efficiency.

**It is often the combination of tools or approaches that enables the desired change**

### Design and approval of the Multi-annual Sectoral Plan for Water and the Environment of the Republic of Guatemala and the creation of the Water Advisory Group (Gabinete Específico del Agua)

Water planning is being used as a tool in Guatemala to optimise the social, economic and environmental outcomes of water management. The Multi-annual Sectoral Plan for Water and the Environment was designed to reorganise the development of the environment and water sector and to provide a strategic path in order to achieve results by improving organisational performance within the goods and services framework entitled by law. The Water Advisory Group was created to enable the efficient management of water resources and to ensure it promotes the economic and social development of the country. Elisa Colom Caballeros de Moran from the Water Advisory Group mentioned that intra-ministerial and inter-secretarial cooperation on water is a major challenge. This approach requires political commitment at the highest level, a long-term perspective for achieving sustainability, and policy coherence and coordination.

A number of important steps have been made to make the provision of water services financially sustainable while economically viable. Various schemes have been implemented to establish cost recovery tariffs which coupled with well thought and transparent subsidies have produced positive outcomes. Colombia provides a successful example of the implementation of cost recovery tariffs (capital and O&M costs) for water services, with structured tariffs allowing the implementation of subsidies for low income groups. This has been implemented alongside regulatory and institutional reforms, including a law which required water utilities to calculate the real costs of providing water and sanitation services and the ability for utilities to act as private enterprises.

> ***"The poor can pay for their drinking water and utilities can be sustainable if they work together with the users"***
>
> **Diego Ernesto Fernandez Giraldo, University of Valle**

## Tools and approaches adopted in the Western Asia region

Access to water and sanitation is a critical driver for the green economy as it cuts across all the other MDGs. In the Western Asia region, there is a recognised need for improvements to the MDG indicators which are currently health-based and only assess access to improved infrastructure. To address this shortcoming, a regional mon-

itoring initiative has been approved by the Arab Ministerial Water Council to incorporate additional indicators specific to the Arab region that reflect the level and quality of service, as well as environmental protection.

**Access to water and sanitation is a critical driver for the green economy as it cuts across all the other MDGs**

Countries have adopted a number of tools to address their water challenges, including financing, capacity building, and technology development and application. There is scope for increasing efficiencies and reducing water loss. The region has shown a growing interest and reliance on non-conventional water resources such as desalinated water and treated wastewater. Some countries –particularly the energy-rich GCC countries– have been able to exploit desalination technology, but the poorer countries in the region do not have this option available to them. Wastewater treatment is becoming an increasingly popular source of water for urban areas and also generates benefits for the environment by reducing pollution discharges and freshwater withdrawals. Traditional technologies and water management practices, such as household level rainwater harvesting reservoirs in Palestine and Jordan, are also proving useful approaches for improving water management.

Reforms in the water and sanitation sector have taken place in many Western Asian countries. Adjustments to tariffs, decentralisation and commercialisation have resulted in more efficient utilities that are able to provide more reliable service levels. This has alleviated the reliance on more expensive and poorer quality water provided by private vendors. In Yemen, the ongoing reform of the urban water and sanitation sector is a vehicle for increasing funding to expand service provision and provide access to the poor – a necessary foundation for green growth. Tariffs have increased but are still low compared to private water vendors, and utilities have benefitted from greater financial sustainability and improved operations.

Even within the Western Asia region, the differences between countries are great. Forging sustainable pathways towards a green economy will require taking into account national specificities and tailoring solutions at the national level accordingly.

### Reform of the urban water supply and sanitation sector in Yemen

In Yemen, the urban water and sanitation sector was characterised by poor quality services provision and low financial viability, largely due to badly kept infrastructure, weak technical capacity and very high unaccounted-for-water rates. An ongoing reform has dramatically reshaped the sector, shifting power away from a central authority to local agencies. Better customer services, more financial stability, and better protection of the least advantaged groups are some of the most positive outcomes of the reform initiative. As a result, water supply coverage rates increased from 47% in 2002 to 71% in 2007, and sanitation coverage rates increased from 25% to 52%.

## Governance and institutions in the LAC and ESCWA regions

Effective governance, political will, a long-term perspective and adequate institutional capacity are all crucial prerequisites for the successful implementation of any of the tools presented in this report. This is the case in both LAC and Western Asia, where weak institutions and poor governance are major barriers to transitioning to a green economy. Good governance means the efficient management of a country's resources –along with its accompanying laws, policies and institutions– in a manner that is open, transparent, accountable, equitable and responsive to people's needs.

Effective governance, political will, a long-term perspective and adequate institutional capacity are all crucial prerequisites for the successful implementation of any tool

In the LAC region, institutions are often weak in their enforcement and operational capacities, and in some cases are unable to deal with water allocation issues, extreme events and problems such as pollution and aquifer depletion. Many countries have implemented significant reforms to water legislation and management policies, and nearly all countries have implemented reforms to the water supply and sanitation sector, with mixed results. Regulatory frameworks for water provision and allocation are in some cases not enforced. Political interference, lack of self-financing and underinvestment are also major problems in some countries. There have been many advances but work still remains to be done and reforms need consensus at all levels. Regulation of services, building institutional capacity and cost recovery tariffs are all priorities for moving forward in the transition to a green economy.

> ***"We need to develop training modules to build capacity and help utility managers perform better. ACWUA acts as a platform for knowledge sharing."***
>
> **Khaldoun Khashman, Arab Countries Water Utilities Association (ACWUA)**

Institutional challenges in the Western Asia region are considerable. Some countries have outdated water legislation and implementation and enforcement of existing legislation is poor. Water resources management is in some cases fragmented amongst various institutions and stakeholder participation is often limited or ineffective. Inadequate financial investment in the sector is accompanied by the low pay and morale of water professionals. This leads to qualified professionals becoming disillusioned and leaving the country because they see how appointment decisions are often not based on merit and capacity. Poor monitoring, reporting and dissemination of water data is also an impediment to improving water management in the region.

Some Western Asian countries have implemented reforms in the water and sanitation sector as well as institutional reforms to incorporate principles of integrated water resources management. Capacity development is a key tool for addressing governance and

institutional deficits in the region. A regional initiative –the Arab Countries Water Utilities Association– was designed to address capacity constraints holding back water utilities, with the overall objective of improving the efficiency and levels of service of water supply and sanitation provision.

### Capacity development in the Arab Region: The role of ACWUA in promoting the exchange of experiences and expertise

The Arab region is the most water scarce region in the world and suffers chronic problems including weak environmental policies, lack of investment and regional conflicts over water. The Arab Countries Water Utilities Association was founded in 2009 by key water sector representatives in the Arab region and serves as a platform for water utilities to communicate and exchange experiences. The initiative uses a range of capacity building tools to improve regional cooperation and promote best practice, including the provision of training programmes, publications, advisory services on water legislation and policies, and the promotion of performance standards and professional certification.

# 8. Side events

## Setting the scene: water security and green growth

There were three side events that were complementary to the main conference programme. These were: 'From theory to practice: ways to foster inter-sectoral coordination and planning for better addressing water, energy and food security' convened by the Government of Germany; 'Spanish business dialogue on water and the green economy' convened by the Botín Foundation; and 'Stakeholder dialogue on the green economy in Spain' convened by ECODES. This section presents a brief summary of these events.

## Water, energy and food nexus

The Government of Germany ran this side event as a precursor to the Bonn2011 Conference 'The water, energy and food security nexus – solutions for the green economy'. The discussions were used to shape the preparations for the Bonn2011 Conference. The conveners presented five theses related to the water, energy and food security nexus, which were discussed by over 30 participants from different regions and UN Organisations:

- An integrated nexus-perspective on water, energy and food security requires new inter-sectoral institutions;
- Water, energy and food security are mainly endangered by bad water governance rather than by shortage of water resources;
- Sectoral incentives – namely subsidies – discourage inter-sectoral thinking and action;

- Using wastewater as a resource requires a change in values and behaviour which will take generations. As change is urgently needed, appropriate regulatory measures combined with strong enforcement are imperative;

- We do not need to worry about the availability of water resources – in the past, mankind was always able to cope with the challenges by technical innovations.

A number of key messages emerged from the discussions:

- **Context matters.** Integration of energy, water and food security needs to take into account of the level or context, be it regional, national, or international.

- **Governance matters.** Given the stress of water resources, such as climate change, we cannot afford to have bad water governance, if we want to achieve energy, water and food security nexus for ourselves and future generation.

- **No one-size-fits-all is important.** Instead of subsiding water for all, allow water top-up for marginalised populations (socialised pricing).

- **Information and knowledge are important.** Increasing understanding and education are the key to changing behaviour and regulation.

- **It is everybody´s business.** Technology innovation is not enough. Change in consumption patterns and behaviour is also needed.

## Spanish business dialogue on water and the green economy

This objective for this side event was for Spanish business representatives to discuss the challenges of water and the green economy. Business leaders involved in the management and use of water resources discussed ways to reconcile sustainable production with increasing productivity and growth. Amongst the topics discussed by the participants, including representatives from Nestlé, the Entorno Foundation, Ecodes and the Technology Platform for Water, were the influence of globalisation and food trade on water policy, barriers to valuing commitment to clean production, and specific problems in different regions of Spain.

A number of members of the Water Observatory of the Botín Foundation presented preliminary findings from their project 'Water, food security and nature conservation'. The Water Observatory is a research group of the Botín Foundation formed by scientists of various disciplines from the Complutense University and the Polytechnic University of Madrid. The project seeks to secure global water supply and equitable access to food through efficient water use which minimises environmental impact. The project is based on the assumption that many of the water challenges faced in the world stem from poor management rather than physical scarcity.

The management models proposed by the Observatory opened the debate with the business representatives. Panellists included Jordi Aymerich from Nestlé and Miguel Lopez Estebaranz from the Spanish Technology Platform for Water. This Platform facilitates technology transfer between the public and private sectors and works closely with the Ministry of Science and Innovation, the Centre for Industrial Technological Development and the Ministry of Environment. Panellists discussed important issues such as: the implications of the green economy concept for the manufacturing sector; how to create employment and wealth through cleaner production; the obstacles for implementing the green economy principles in business; and how businesses that use and rely on water can contribute to its conservation and management.

The following conclusions were drawn based on the presentations and debate that took place during the event:

- The only way out of the global crisis is building a green economy, and this is only possible if all stakeholders join efforts.
- The role of business is fundamental and sustainability shows its benefits in terms of income. All stakeholders must be moving in the same direction.
- Nature is a source of inspiration and Spain is the second most innovative country in the field of water.
- The food security challenge must be met with maximum efficiency in the use of natural resources.
- The green economy is a business opportunity: water footprint and carbon footprint labelling.

## Stakeholder dialogue on the green economy in Spain

This side event was convened by the Foundation Ecology and Development (ECODES), an independent NGO that works to foster dialogue and collaboration with stakeholders in the implementation of programmes that promote sustainable development and social change. Water management is one of their main areas of focus.

An output of the stakeholder dialogue was a statement of recommendations for Rio+20. Three targets are proposed:

- Achieve the targets and commitments of the Millennium Development Goals.
- Ensure the implementation of the human right to water, with States recognising it in law.
- Achieve the objectives of sustainable development.

To achieve these goals and leverage the full potential of water to advance the green economy, it is necessary to activate three levers of change:

- **Public regulation.** The concept of public goes beyond the State and includes civil society and anything that generates collective benefits. There are examples in Spain of public water utilities successfully undertaking technology transfer, achieving efficient service provision, and generating jobs and wealth in their respective municipalities. The State has a responsibly to design and implement public policies that guarantee services based on a commitment to sustainability and equity. Good governance is a priority. The Hydrographic Confederations in Spain are good examples of management bodies at the river basin level and could be replicated elsewhere.

- **Market incentives.** We must work towards an economic model which puts finances to work for sustainability, generating welfare benefits for people. It is necessary to reform the financing mechanisms of the IMF and the World Bank, with a percentage of funds allocated to water management, made with conditions of transparency and fighting corruption. Experiences of public-private partnerships have demonstrated that it is essential to establish clear rules of the game, defining the role of private enterprise. Payments for Ecosystem Services and a French initiative which through the Oudin Law allows municipalities to donate a percentage of the water bill for projects related to water and sanitation provision, are two promising schemes that could be replicated elsewhere. Three objectives must be pursued: efficient use of resources, savings, and reuse.

- **Cultural change.** Achieving a green economy requires a rethinking of the current development model and a deep cultural transformation in the values that govern our society. Education is necessary and the government, the media, research institutes and NGOs all have a role to play in increasing understanding of the green economy, good governance and the importance of water. All stakeholders must be involved in the transition. The 'Zaragoza with water' initiative which has seen commitments to improving water use efficiency from over 100,000 citizens serves as an example of successful stakeholder engagement for generating change.

# 9. Key messages on water and the green economy

Rio+20 needs to demonstrate that a green economy is possible; that there are opportunities to advance in social justice, economic progress and conservation of the environment within the range of available resources and technology. **A green economy is for everyone** and developing countries can take a leading role through adopting innovative initiatives that generate economic, social and environmental benefits. **We all have a joint responsibility to progress to a different economic model. We must not miss this opportunity.**

1. **Achieving a green economy is not possible without ensuring everyone has access to basic water and sanitation services.** Across the world, access to these services has proved to be a critical step for lifting people out of the vicious cycle of poverty and environmental degradation.

2. **Transitioning to a green economy in water requires a shift from current practice.** Some key tools to promote the necessary change and support the transition: (1) economic instruments; (2) green jobs; (3) cost recovery and financing; (4) investments in biodiversity; (5) technology; and (6) water planning. These tools enable us to overcome barriers, do more with less, to harness opportunities and change behaviours in order to achieve a green economy.

3. **Creating incentives for improving efficiency is appropriate where basic water and sanitation services are already being provided.** Incentives can modify individuals' behaviour in a predictable way in order to achieve desired policy goals, for example: reducing water consumption, reducing pollution loads, or adopting a modern irrigation technique. Using economic instruments has a number of advantages. They can (i) avoid costly investments and make the case for low-cost, non-technical measures (e.g. ecosystem services to secure water or protect against floods); (ii) generate revenues to fund water management and infrastructure; (iii) align incentives and strengthen policy coherence across sectors; and (iv) provide information on the costs of status quo, the benefits of reform, and the distribution of these costs and benefits.

Key messages

4. **There is an important role for social dialogue and for communities in the provision of water services. Community initiatives are vital in places where government action does not reach.** The pro-poor approach being adopted by many governments and international organisations is paying off, with a greater focus on outcomes, social dialogue, social contracts and community participation. Social dialogue is a power full means to improve effectiveness in service delivery for a socially inclusive development that provides adequate incomes, social protection, respect for the rights of workers, and give workers a say in decisions which will affect their lives.

5. **The transition to a green economy requires mobilising more funds, but also increasing efficiencies to make better use of the limited financial resources available.** Funds are required to drive sustainability and growth; invest in water and sanitation services and infrastructures; alleviate global poverty; foster innovative green technologies; create new 'green' job opportunities; reduce scarcities; reduce waste and greenhouse gas emissions; and increase efficiencies in the production and consumption of water and energy. Pro-poor tariffs systems are essential for ensuring the provision of water services to the poorest.

6. **Investing in natural capital is critical for restoring and sustaining the water-related services provided by ecosystems.** Healthy freshwater ecosystems provide services that are crucial for human survival. The poor particularly often depend directly on water and other ecosystem services provided by rivers, lakes and wetlands for their livelihoods. There are real opportunities for **Payment for Ecosystem Services**, which is proving a successful instrument for financing environmental protection throughout Latin America, but also in Africa and Asia. Nature is improved by rewarding its conservation and guaranteeing the continuous provision of the welfare benefits produced by ecosystems.

7. **Governments need to facilitate innovation and adoption of greener water provision and water use technologies, contributing to job creation and structural transformation towards greener economies.** Technologies help to close the increasing gap between water supply and demand by increasing water availability or increasing the efficiency of water use. Most of the necessary water technologies for promoting sustainable water management are already existing and ready for application on larger scales. However, barriers to adoption –such as lack of access to finance, knowledge and patents– must be overcome. There are opportunities for developing countries to 'leapfrog' with information technology.

8. **Water planning is a powerful social tool for identifying the best way to use water resources to meet the competing needs of different users.** Green growth requires that social improvement and economic growth are made compatible with the conservation of ecosystems. Participatory planning is a key instrument for achieving this, allowing the identification of proposing measures and infrastructures needed for economic and social growth, and the protection of long-term ecosystem services. Participatory planning enables the consideration of trade-offs and the alignment of these goals. It is essential to build governance and institutional capabilities to design and effectively implement long-term integrated water management plans in order to support the transition towards a green economy.