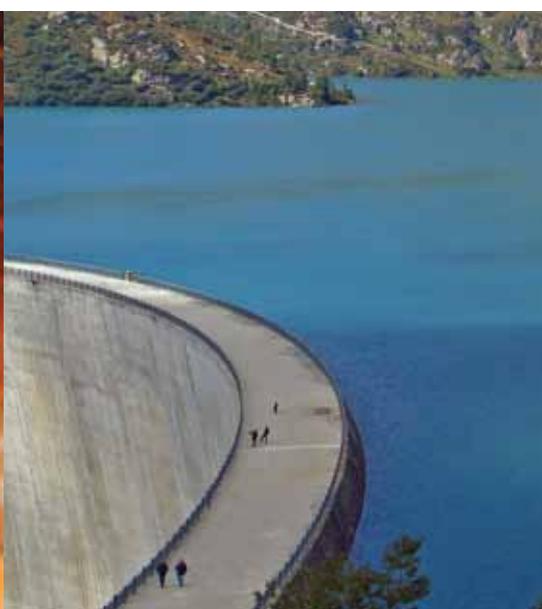


WATER: FIT TO FINANCE?

CATALYZING NATIONAL GROWTH THROUGH INVESTMENT IN WATER SECURITY



REPORT OF THE HIGH LEVEL PANEL
ON FINANCING INFRASTRUCTURE
FOR A WATER-SECURE WORLD

APRIL 2015



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Report of the High Level Panel on Financing
Infrastructure for a Water-Secure World

April 2015

World Water Council

—

Organisation for Economic Co-operation
and Development (OECD)

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The World Water Council has a long held interest in the issue of financing water infrastructure. The Council was instrumental in establishing the Camdessus Panel which had a major impact on financing models and volumes in the last decade. This latest High Level

Panel, convened jointly with the OECD, represents the latest chapter in our thinking on this critical issue.

It is clear from this report that there is no silver bullet; rather there is a nuanced mix of options that are available. However, for me one of the most important findings of this work is the emerging importance of multi-purpose infrastructure. Historically, much of our water infrastructure has been primarily single purpose, such as flood control, irrigation or public water supply, or hydropower. I do not believe that this approach is tenable in the future.

Our quest for greater water security is occurring in the face of increasing hydrologic uncertainty, intensified by climate change, and increasing demand for water. This requires that we think more carefully about the design and impacts of water infrastructure. We need to seek synergy between water security and energy, transport, food, land use and the environment. We must also take into account the upstream and the downstream social, economic and environmental impacts. For me it is clear - in a changing world we will need more flexible multi-purpose infrastructure.

A handwritten signature in black ink that reads "Ben Braga".

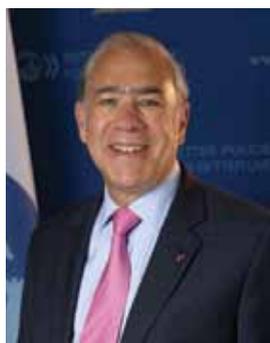
Benedito Braga

President, World Water Council

It is also clear that our current financing models and approaches do not encourage multi-purpose infrastructure. The sums involved are typically large, some components are not financially profitable under strict market conditions, many different stakeholders are affected, there are a number of competing users, and conflicts over priorities often arise between them. To cap all this, many large projects are transboundary, involving two or more countries. Yet, when we look at the recent history of many developed countries, the implementation of this kind of infrastructure has clearly played a major role in reducing poverty and increasing social welfare.

The theme for the 7th World Water Forum is implementation of water solutions. It is a great time for water, as we have unprecedented opportunities for much needed collective action to address water security. I expect the Post-2015 Development Agenda and the United Nations 21st Climate Change Conference in Paris to be turning points in our capacity to recognize the role of water in the climate debate and to tackle global changes through increased finance for water infrastructure.

The joint challenges of adaptation to climate change and shared responsibility are large and complex. However, I believe that multi-purpose infrastructure creates a real opportunity to more visibly address both these challenges from the perspective of our precious water resources. This may not be just a question of our financing models, but perhaps also how we implement our enabling environment which this report reinforces as an essential ingredient of success. This I believe is a significant agenda for the next decade.



2015 is an important year on the water front. In September, the international community will define the Post-2015 Sustainable Development Goals. In December, the French government will host the 21st UNFCCC Conference of Parties in the quest to negotiate a new agreement for

meeting the twin challenges of climate change mitigation and adaptation. These are unique opportunities for the water community to engage with and contribute to wider policy objectives and to demonstrate the defining role that effective water management plays in supporting economic growth and development and improving environmental outcomes.

Infrastructure is a key factor in the water and growth story. Water infrastructures are essential to harnessing hydrological resources and exploiting local capacities to contribute to social and economic development. Governments also increasingly understand that the most beneficial water investments are part of a broader water planning process – they need to be sequenced along pathways in ways that allow societies to adapt to shifting circumstances. These observations were underpinned by the GWP-OECD *Global Dialogue on Water Security and Sustainable Development*, which highlighted how water resources can play a defining role in economic development.

This report of the *High-Level Panel on Financing for a Water Secure World (HLP)*, of which I am honoured to be the Chair, provides a specific focus on how water infrastructures can be financed. The HLP has brought together a diverse range of eminent persons in a number of important segments of the water and finance sectors to address the infrastructure financing question. The publication covers a broad scope, both geographically and in terms of water infrastructures, and builds on the reports from the Camdessus Panel in

2003 and the Gurría Task Force in 2006. It seeks to go beyond the threshold question of “How much finance is required for water infrastructure” to address the new and emerging issues around financing.

The report makes a clear call for diversity. Infrastructures for water security take many forms, from small scale projects initiated by local entrepreneurs to large infrastructures that serve multiple purposes. Sources of funding are increasingly diverse as well with carbon finance, long-term investors and new specialised institutions all coming into the investment space in recent years.

The report also makes a call for efficiency in water investment: avoid building future liabilities; properly maintain existing assets; and consider efficiency not only at the project level, but also at the level of a sequence of investments, in the context of broad social and economic development policies.

Governments, central and local, would benefit from exploring any opportunity to enhance efficiency of water investments and exploiting diversity. Good water governance is critical to co-ordinate across levels of government and policy areas, as well as to help strengthen capacity, and to enhance integrity and transparency. Moreover, the report also highlights the importance of engaging with a variety of stakeholders who have their say on the level of water security they deem proper, how much they are ready to pay for it, and what is a fair allocation of risks and costs.

The 7th World Water Forum and the 3rd International Conference on Financing for Development, in Addis Ababa, in July 2015 are important milestones to raise awareness around water-related issues and take concrete actions as we approach the Sustainable Development Goals Summit and the COP21. The OECD stands ready to move this agenda forward and to take an active part in advancing better policies to finance a water secure world.

A handwritten signature in black ink, appearing to read 'Angel Gurría'. The signature is fluid and cursive, with a long horizontal stroke at the end.

Angel Gurría
Secretary-General, OECD

The HLP is an initiative of the World Water Council and the OECD and chaired by the Secretary-General of the OECD.

The Membership of the High Level Panel is as follows:

African Development Bank
AMF Guarantee Corporation
Asian Development Bank
CAF – Development Bank of Latin America
ERSAR
Blackstone Portfolio Company
Jal Bhagirathi Foundation
Ministry for Infrastructure and the Environment - The Netherlands
Ministry of Land, Infrastructure and Transport, Republic of Korea
Ministry of Water Resources – China
Nestlé SA
Groupe des Eaux de Marseille
Suez Environnement
The Nature Conservancy
The World Bank
UFRJ - Federal University of Rio de Janeiro
US Army Corps of Engineers
Veolia Environnement

The proceedings of the HLP and preparation of this Report have been guided by a Task Force chaired by Prof Dogan Altinbilek and including Mohammed El Azizi, Gye Woon and Jerome Delli Priscoli.

The HLP also drew on the expertise of a larger Advisory Group which met twice in Paris and once in Marseilles in addition to contributing electronically to successive versions of the draft Report. This Advisory Group comprised Aziza Akhmouch, Anthony Cox, David Elkaim, Guy Fradin, Celine Gilquin, Philippe Guettier, Bernard Guirkingier, Patrick Lavarde, Xavier Leflaive, David Lloyd Owen, Abel Mejia, Maimuna Nalubega, Gerard Payen, Pierre-Alain Roche, Philippe Rohner, Monica Scatasta and Pierre-Frederic Teniere-Buchot.

Early drafts of the Report were influenced by the results of a Delphi Survey of key informants.

WWC representatives and consultants gathered evidence through consultation meetings in Mexico City, Washington DC, Sao Paulo, Brasilia, and Beijing.

In addition a teleconference was held with the African Development Bank, the principal author visited the Asian Development Bank in Manila, and several working sessions were held with OECD officials. The Task Force and consultants convened informally at the Stockholm World Water Week.

The HLP met in full session in Paris (November 26, 2014) and is scheduled to meet again for the presentation of this Report at the 7th World Water Forum in Korea (April 13, 2015).

ACKNOWLEDGEMENTS

The HLP is an initiative of the World Water Council and OECD. The Panel's first debts are to the President of WWC, Benedito Braga, and to the Secretary-General of OECD, Angel Gurría, who agreed to chair the Panel and make the expertise of OECD available to it.

The principal author of this Report is James Winpenny of Wychwood Economic Consulting Ltd, working in close collaboration with Xavier Leflaive and his colleagues at the OECD. Several others were involved in preparation of the Executive Summary, including Benedito Braga, Abel Mejia, Jerome Delli Priscoli and Fraser Macleod.

Members of the Panel, the Task Force and Advisory Group contributed a wealth of data and advice. Many other organisations and individuals provided their time, materials and advice to the Panel. Appendix 2 contains a full list of materials received during this exercise.

Many people were involved in the organisation of the regional consultations, but particular acknowledgement should be made of Roberto Olivares in Mexico City, Newton de Lima Azevedo, Giancarlo Gerli, Marcia Andrea de Souza Freire Martinez and Marcus Thadeu Abicalil in Sao Paulo and Brasilia, Steven Stockton, Ada Benavides, Diego Rodriguez, William Rex and Sergio Campos in Washington DC, and Vice President Jin Hei and Consul Liu Zhiguang in Beijing.

Thanks are also due to the late Prof John Briscoe, Christopher Gasson, Fraser Macleod, Lyndsay Mountford and Max Winpenny for their advice and professional inputs to the making of this Report and to Danielle Gaillard-Picher for her unfailing advice and support in all things.

AFD	Agence Francaise de Developpement	MDG	Millennium Development Goal
AfDB	African Development Bank	MIGA	Multilateral Investment Guarantee Agency
AIIB	Asia Infrastructure Investment Bank	MPI	multi-purpose infrastructure
AsDB	Asian Development Bank	NGO	Non-Governmental Organisation
BOT	Build, Operate, Transfer	OBA	Output-Based Aid
BOOT	Build, Own, Operate, Transfer	OPEX	operating expenditure
BTO	Build, Transfer, Operate	O&M	Operation and Maintenance
BRICS	Brazil, Russia, India, China, South Africa	ODA	Official Development Assistance
CAF	Corporacion Andino de Fomento	OECD	Organisation for Economic Cooperation and Development
CAPEX	capital expenditure	PBC	Performance-Based Contract
CSR	Corporate Social Responsibility	PES	Payment for Ecosystem Services
DAC	Development Assistance Committee (of OECD)	PPIAF	Public-Private Infrastructure Advisory Facility
DBOT	Design, Build, Operate, Transfer	PPP	Public-private partnership
DFID	UK Department for International Development	PSP	Private Sector Participation
EBRD	European Bank for Reconstruction and Development	RBF	Results-Based Finance
EIB	European Investment Bank	R&D	Research and Development
EU	European Union	ROM	Rehabilitate, Operate, Maintain
Forex	Foreign Exchange	SDGs	Sustainable Development Goals
FT	Financial Times	SIDA	Swedish International Development Agency
GDP	Gross Domestic Product	SWF	Sovereign Wealth Fund
GLAAS	Global Annual Assessment of Sanitation and Drinking Water	UNSGAB	United Nations Secretary-General's Advisory Board on Water and Sanitation
GWI	Global Water Intelligence	WASH	Water, sanitation & hygiene
GWP	Global Water Partnership	Watsan	water supply and sanitation
HLP	High Level Panel	WEF	World Economic Forum
ICESDF	International Committee of Experts on Sustainable Development Financing	WHO	World Health Organisation
IaDB	Inter-American Development Bank	WRM	Water Resources Management
ICA	Infrastructure Consortium for Africa	WSP	Water and Sanitation Program (of the World Bank)
IDA	International Development Association	WSS	Water supply and sanitation
IFC	International Finance Corporation	WWC	World Water Council
IFI	International Financing Institution	WWTPs	wastewater treatment plants
IMF	International Monetary Fund		
LIBOR	London Inter-Bank Offered Rate		
M&E	Monitoring and Evaluation		



WATER: FIT TO FINANCE?

CATALYZING NATIONAL
GROWTH THROUGH
INVESTMENT IN WATER
SECURITY

That water is important to human wellbeing is undeniable. That securing water for different uses provides socioeconomic development of countries is also undeniable. However, investing in water resources development is still a challenge for governments around the world.

The water community is very much aware that water infrastructure is key to delivering long-term water security. This means ongoing investment in more storage capacity, more diverse water infrastructure, more efficient water resources use and management, strengthened governance, and better information. However, each choice that is made about water has implications for the wider political economy.

Experience demonstrates that investment and financing are critical to build and operate the infrastructure needed for a water secure world. However, put simply, at a global scale we are not investing enough. More needs to be done.

We need to think carefully about the design and impacts of water infrastructure, in the context of a changing climate. There is also a need to seek potential synergies between water security and energy, transport, food, land use and the environment. In a changing world (from population growth, economic dynamics, and climate change) we need flexible multi-purpose infrastructure. And we must take into account the upstream and the downstream social, economic and environmental impacts. As with any intervention in the natural environment there are choices

to be made, each with impacts that are both positive and negative, in other words, there are costs and benefits.

The World Water Council and OECD jointly convened a High Level Panel (HLP) to raise the global debate on how to scale up financing of water infrastructure. The result of the HLP's work makes it clear that there is no silver bullet that will bridge the financial gap arising from the burgeoning demand for water and the current limitations for supply. Rather there is a more nuanced mix of options that needs to be brought to bear by all stakeholders—governments; financial regulators; productive water users and beneficiaries of water security, such as land and property developers; banks and other commercial financing and investment institutions; water utilities and service providers; individual water users and consumer groups; international, regional or basin agencies; networks and research bodies; International Financing Institutions, Donor Agencies; and civil society organisations and educators.

Our challenge is clear: water infrastructure must become “fit to finance”. The question is how to do this. Below are seven key perspectives that the High Level Panel believe are necessary if water is to become “fitter to finance”.

1. Water security is an essential requisite for national economic growth

Much has been written and said about the vital importance of water. Unfortunately, the actual priority it receives in the political, economic and environmental agenda, local and national budgets and investment programmes, and allocations from financing institutions, does not match this rhetoric. Water is still widely perceived as an end-of-pipe “social” sector, important for health, livelihoods and the environment, but unproven as a vital national investment to ensure welfare and support economic growth.

Yet, there is a deeper understanding of the positive impact of water security on economic growth. For example, the GWP/OECD *Global Dialogue on Water Security and Sustainable Growth* provides evidence that water security is much more than a component of wider economic goals; rather it is a crucial influence on the nature and speed of wider economic development. Strategic water investment decisions can open up opportunities for economic development. Sustained investment in water infrastructure and its “enabling environment” is an essential pillar for growing economies.

The real value of water security to wider economic development needs to be better demonstrated. There is a need to move beyond traditional analysis of economic value or conventional financial investment criteria which can disadvantage water compared with other infrastructure sectors. One way to do this is to integrate water investments into long-term planning that includes sequences of investments along a coherent pathway yielding the highest returns. There is much we can learn from an improved understanding of past water infrastructure projects in regional economic development. Equally, long-term development strategies, at country, basin or city level, should reflect local hydrologic conditions and capacities to invest in and manage water infrastructures.

2. Increasing importance of multi-purpose water infrastructure

The quest for greater water security is occurring in the face of increasing hydrologic uncertainty, rivalry between user groups, and the need to provide *public goods* such as drought prevention, flood control and environmental protection. Historically these different perspectives might

have resulted in infrastructure designed with limited uses in mind. Looking to the future, these pressures will be intensified by climate change and increasing demand for water. Hence it is clear that multi-purpose water infrastructure (MPI) is set to become an increasingly important asset class by itself.

MPI does, however, present specific financing problems, in addition to those generic to water. The sums involved are typically large, some components are not financially profitable under strict market conditions, many different stakeholders are affected, there are a number of competing users, and conflicts over priorities often arise between them. To cap all this, many large projects are *transboundary*, involving two or more countries.

To realise its potential MPI should be treated as an asset category deserving specific focus in financing institutions and evaluation criteria. A basic choice is that of the appropriate financing model, according to the project’s nature, components, and risk-reward structure. Larger projects are likely to need strong involvement by Governments as drivers of investment and providers of financial support following long-term strategic options to secure welfare and growth. It will also be necessary to ensure that costs and benefits within MPI projects are transparent, and any cross-subsidies between their different components should be explicit.

3. Getting the enabling environment right

There is growing consensus that water security is built on a long-term strategic perspective of development and supportive enabling environment. Therefore coping with future water challenges raises not only the question of “what to do” but also “who does what”, “why”, “at which level of government” and “how”. Policy responses will only be viable if they are coherent, if roles and responsibilities are clearly allocated, if stakeholders are properly engaged, if well-designed regulatory frameworks are in place, if policy-relevant information guides decision-making, if there is sufficient capacity, integrity and transparency, and if monitoring and evaluation help adjust policy pathways where need be. Such an enabling environment could be built on best practice regimes such as the OECD Principles of Water Governance and the Lisbon Charters for Public Policy and Effective Regulation of Water.

Institutions also need to adapt to changing circumstances, and political will is key to transition towards more sustainable practices. When it comes to implementing projects, it is recommended that public authorities and International Financing Institutions (IFIs) follow international competitive bidding procedures, and independent supervision of construction and implementation. Developing and publicising data on best practice and cost yardsticks could also help to improve competition and reducing inefficiencies.

4. Make the best use of competition and innovation

The development and management of water resources on a major scale has traditionally been dominated by public or private monopolies. However, as economies mature there is growing evidence that institutional and economic reforms can allow market forces to play a part, particularly in service sectors like water supply and sanitation. For example, there is a diversity of delivery options for water services across countries, which is characterised by a mixture of public utilities, private companies and other institutional forms such as cooperatives and not-for-profit entities. In many instances the incumbent service provider, whether private or public, enjoys either a monopoly or a dominant market position. However, in the absence of competition, many of these service providers become inefficient, provide unsatisfactory service, and are unable to keep up with growing consumer demand from existing and new customers.

Encouraging innovation to flourish requires a regime that provides strong economic and financial incentives to suppliers and consumers of water. Water tariffs set at sustainable cost-recovery levels would promote more careful and efficient use, and reward the development and spread of water-efficient appliances and practices. The use of abstraction charges, bulk water tariffs, and pollution charges are also a necessary part of this wider incentive system, as they make water-efficient options more competitive. On the other hand, “perverse” incentives such as subsidies – which encourage waste and over-use of water – should be removed, as there are much more effective and cost-efficient instruments than cheap or subsidised water to address the potential impacts of water prices on disadvantaged groups or industries.

5. Overcoming inefficiency

There is evidence that efficiency of investment in water infrastructure and services could be improved in order to increase the attractiveness of the water sector as a destination for investment. These improvements can take place at three levels.

First, there is room to improve technical and operational efficiency, which in turn would enhance the financial performance of water services. Water losses and waste in transmission, distribution, and consumption are well known in countries at all levels of development. Water is also a major – and inefficient - user of energy in many of its processes. Tackling these operational inefficiencies will require stronger financial management in many utilities, and introducing more widespread use of opex-capex coupling, life-cycle costing and optimal maintenance.

Second, there are ample opportunities to improve efficiency at the project design and selection stage. This could be the result of thorough estimation of total lifecycle costs, better project management and competitive procurement. Equally, enhanced efficiency could result from a more systematic exploration of the potential benefits of “soft” solutions such as green infrastructure, demand management, and water reallocation, at the expense of built infrastructures.

Third, efficiency of water investment is higher when projects are connected in sequences that combine infrastructures, institutions and information along coherent pathways, reflected in integrated plans. A thorough planning and sequencing of water investments could avoid very costly mistakes, inconsistencies and lock-in. It can make the case for multipurpose infrastructures, which can serve multiple policy objectives at least cost.

Each level would potentially benefit from the involvement of expertise at the design stage, transparent and competitive procurement, and amalgamation of smaller individual investments to achieve economies of scale. Investment facilities set up by governments and IFIs can be expected to have a key role in pre-project preparation and in forging credible financing packages.

Greater use of results-based financing will compel both public and private contractors to pay more attention to optimal design and efficient implementation and

operation. Private companies can bring expertise in technical, operational and financial matters through performance-based contracts. This could be achieved across the spectrum from commercial procurement of services through to public-private partnerships to build, operate, and manage infrastructures and water delivery systems including irrigation, public water supply, and wastewater capture and treatment.

By introducing a focus on greater efficiency throughout the water investment cycle from design through construction to ongoing operation and maintenance it is expected that cash flows would improve. In turn improved cash flows will increase the attractiveness of water projects to investors and financiers. Over time, the credibility of water authorities, companies, and project sponsors in capital markets will grow, reinforced by a stronger pipeline of “bankable” projects. In other words, a focus on technical and financial efficiency will ensure that water becomes “fitter to finance” in all respects.

6. Balancing financial risk and reward

Financiers and investors judge a water financing proposal according to the balance of financial risks and rewards relative to investment opportunities in other infrastructure sectors and the economy at large. A key challenge for water infrastructure is that projects are generally evaluated on a shorter time frame compared to the life-cycle of large infrastructure projects. Different types of financiers and investors have different risk appetites, different criteria, and have different expectations about the return on their investment. Therefore, sponsors of water projects need to work on both the risk and reward side of the equation.

The *reward* side of the equation can be boosted through reduced water-related risks for water users (farmers, industries, cities, etc.), improved cash flow from increased revenues, more efficient operations, and taking up new business opportunities. This could include revenue opportunities such as “smarter” use of tariffs, improved credit and bill management, provision of value-added services, and exploiting the by-products of wastewater management.

On the *risk* side of the equation the critical issue is the rational and fair sharing of risks between partners. Given

the heavy dependence on external capital for water projects foreign exchange risk is of particular concern to sponsors of water projects. The only feasible way of managing foreign exchange risk is through maximum recourse to debt or equity denominated in local currency. However, there is also greater opportunity to mitigate more general financial risk through guarantees, holding a level of equity that reflects the level of risk, insurance instruments, “umbrellas of comfort”, escrow accounts, interest linked to performance or other measures.

It is not possible to fully extinguish financial risk in any project. Hence, the financial risk remaining after all feasible measures have been taken has to be borne by the equity holders, who may be private, public, or both, depending on the nature of the project or company. Where there is overriding public interest in the project, public authorities could be expected to play a leading role in financing, through grants, long-term loans, equity and the various kinds of guarantees and supports to private partners.

7. Accessing new and old finance

In recent years a number of new, non-traditional financial sources have become available for infrastructure more generally, and water infrastructure in particular. These non-traditional sources include construction companies, various kinds of institutional investors such as pension funds, insurance companies, Sovereign Wealth Funds, water funds and new international development banks including BRICS Bank and the Asian Infrastructure Investment Bank.

Further opportunities for water finance arise in the growing resources of climate funds and the growth of Green Bonds. Governments better understand the various methods of tapping into the property values created by water in the context of urban development, and the opportunities to stimulate investment from water users who will benefit from improved water security (e.g. farmers and industries who minimise reliance on freshwater; households who invest in water-efficient appliances; cities which protect catchment, limit rainwater run-off, or use reclaimed water).

The newer sources of finance have their own specific funding criteria, which water project sponsors need

to respond to in order to create propositions with the required appeal. This will require more pro-active engagement with a variety of investors at different scales and from a range of sectors.

Equally, there is much evidence that existing (“traditional”) financial sources have ample scope for increasing their financial commitments, and are actively seeking to reduce the time from project conception to project closure. Underlying concerns remain that not enough water projects are “fit to finance”. Government budgets, such as those for expanding rural water supplies, are regularly underspent, with money returned to central coffers.

Part of the solution is to devote more effort to project identification and preparation, as already noted. Public banks and IFIs could increase their leverage by increasing their co-funding with other lenders, exploiting their “halo effect” with capital markets, and using their expertise

and reputations to add value to projects. IFIs also have potential to attract more grant funding for their specialised infrastructure and water project facilities. For their part, donor agencies, NGOs and other philanthropic bodies could make greater use of their resources as catalysts for innovative policies, including funding for microfinance agencies, to extend water services in poorer and rural communities.

The creation and greater use of *blending* facilities that combine different kinds of finance to suit the needs of specific projects is a particularly promising avenue, especially for large schemes typical of MPI.

At a global scale, this will require a constructive dialogue in the development and co-operation community, in particular between existing IFIs, donor agencies, and the newly emerging international development banks. ■



CONTEXT

INTRODUCTION

WHY THE HLP WAS CREATED

The World Water Council (WWC) in partnership with the OECD has created a High-Level Panel on Infrastructure Financing for a Water Secure World. The Panel contains high-level members from governments, international agencies, private business and finance, the NGO community and academia. It is chaired by the Secretary-General of the OECD.

The Panel's aim is to stimulate a global dialogue on the role of major infrastructure in providing water security, and identify the financial resources - and the means to generate them - for achieving water security globally. The urgency of this dialogue is due to historical shifts in the demand for water and the unprecedented impacts of climatic and hydrological variability which affect the availability of water for social and economic development.

Water insecurity is rapidly growing in many regions and serious droughts and flooding have happened on a major scale. As a result, there is widespread awareness that water insecurity poses a serious risk to a high proportion of the global population and to the global economy.

Evidence is growing¹ that investing in water security is an essential condition for economic growth and for breaking cycles of poverty. Investment in water infrastructure is justified as a basic platform for socio/economic development.

Providing water security means addressing hydrological threats, managing the vulnerabilities of systems, and designing policies and institutions. The OECD cannot agree with the idea that policies and institutions are the main constraints in order to meet the demands of different groups of water users. Future investment will be required for guaranteeing services to growing populations and to support economic growth, while at the same time coping with the costs that water use imposes on

the environment. The more developed countries have the specific problem of updating and rehabilitating old infrastructure, which often does not comply with current regulations and is unsuited to future needs.

A precondition of water security is a better understanding of the impact of hydrological variability and how it can be managed through policy, infrastructure, governance and other factors. The importance of these factors will vary by country, depending on its history, level of social and economic development, geography and climate. Developed countries usually have a relatively high level of physical water infrastructure, but with corresponding costs of rehabilitating ageing assets and adjusting them to new needs. Emerging and developing countries, with lesser endowments of infrastructure, have fewer choices in tackling water risks. This Report is relevant to countries at all parts of the infrastructure development spectrum.

In 2003, in preparation for the 3rd World Water Forum in Kyoto, the WWC co-sponsored with the Global Water Partnership the World Panel on Financing Water Infrastructure (chaired by Michel Camdessus, an ex-Managing Director of the IMF). The new HLP builds on the legacy of this previous report and that of its successor the Gurría Task Force (2006), taking into account the significant developments in global water and finance in the intervening decade. The scope of the HLP will be wider than that of its predecessors - which focused mainly on the financing of water and sanitation² in the context of the Millennium Development Goals.

¹ Evidence on this has been assembled in the Global Dialogue on Water Security and Sustainable growth, a joint initiative of the GWP and the OECD

² The Gurría Task Force also examined agricultural water security

THE PURPOSE OF THE HLP – FINANCE FOR WATER SECURITY

The HLP has three main aims:

- i) To focus global attention on how water infrastructure is currently being financed, and the implications of this for future water development;
- ii) To provide guidance to policy makers in governments, the private sector, civil society and the wider international community about how water infrastructure should be financed in future;
- iii) To spearhead a global and regional process to monitor, evaluate and report on the finance of investment for a water secure world to be regularly presented at subsequent World Water Fora.

Creating water security involves managing a number of risks (GWP/OECD 2015):

- ▶ Water shortage, including droughts: insufficient water to meet the needs of households, businesses, farmers and other beneficial users.
- ▶ Excessive water at certain times and locations, including flooding, storms, sea incursions and high levels of groundwater.
- ▶ Inadequate water supply and sanitation services, which expose societies to public health risks and aggravates poverty.
- ▶ Poor water quality: the lack of water of suitable quality for a specific purpose due to poor sources, inadequate treatment of both fresh water and wastewater, pollution or contamination; the rapid growth of urban populations accentuates this risk.
- ▶ Threats to the resilience of freshwater ecosystems by over-abstraction of water, pollution, destruction of catchments and wetlands, etc.

Water security can never be fully achieved, and comes at a cost. The decisions that a society has to take are over the level of risk that is desirable and affordable in each of

the five domains described above. Difficult choices and trade-offs have to be made between water security and other “securities” such as food and energy – where the pursuit of one can be at the direct expense of others. It is also to be recognized that water security for one country or region may be achieved at the expense of the water security of its neighbours.

In short, water security is about managing risks, being aware of the trade-offs and inter-relationships entailed, and weighing the costs and affordability of options to reduce these risks (OECD, 2013).

SCOPE OF HLP'S WORK

The HLP has taken a broad view of “water infrastructure”. The scope of the Report includes infrastructure and services for strategic water storage, water resource development and management and bulk water supply, as well as water for specific uses. The latter typically include energy generation (hydropower and cooling in thermal power stations), irrigation, municipal and domestic water supply, navigation, flood risk reduction, recreation, assuring sufficient water for ecological system services, and other purposes.

There are various reasons for choosing this broad focus :

- ▶ There are growing needs of water for power, industry and agriculture, as well as for the household needs of growing populations.
- ▶ There is a large backlog for the replacement and rehabilitation of old infrastructure in mature water systems, and the adaptation of existing infrastructure to the likelihood of future changes in climate, water availability and demand.
- ▶ Much of the infrastructure that needs to be created will have a multi-purpose nature, which requires a broader range of considerations than those entailed by single-purpose projects and makes it more complicated to finance.
- ▶ Despite the progress made in extending water services and sanitation to households in the context of the Millennium Development Goals serious gaps

and deficiencies in basic services remain, which are intended to be addressed in the Sustainable Development Goals now being finalised by the United Nations. These Goals will have major financing requirements.

Water infrastructure comes in various forms, both “hard” and “soft”. It is not confined to man-made physical structures such as dams, pipelines, canals, treatment works and flood prevention embankments. Green Infrastructure using land, forests, wetlands and other natural features is increasingly part of the response to water risks. There is an important role for institutions (including markets) and information, as part of the policy mix.

In tackling their water risks in order to enhance water security, countries will have different agendas, depending on their economic status and infrastructure endowments. As already noted, mature developed countries tend to have well developed infrastructure, and in facing their future challenges have a range of options including demand management, using “green” solutions, adapting (or in some cases removing) existing infrastructure, or most likely a combination of these. Countries that have not yet reached this position will be more concerned with establishing basic infrastructure – the “minimum platforms” (Grey & Sadoff, 2007) - which would give them policy options they currently lack.

Water infrastructure needs financing over its full life cycle, including planning, appraisal, implementation, operation, maintenance and replacement. This will require different types of funding for project preparation, initial investment, and the recurrent and periodic expenses of operating, maintaining and replacing the assets.

The HLP considers water infrastructure at a global geographical level. On the one hand, this extends the scope of the enquiry and limits the useful generalisations that can be made. On the other hand, it widens the body of experience that can be drawn on, and adds weight to its conclusions.

The Report has drawn on research programmes in closely related topics being conducted in WWC, OECD and elsewhere. These include work on water governance, the economics of water security, water in urban development, specific aspects of water financing, and financial aspects of the Green Economy and ecosystem services, amongst other topics. The Report has also benefited from a sight of the key reports of the Intergovernmental Committee of Experts on Sustainable Development Financing (ICESDF 2014) and the Sustainable Development Solutions Network (Sachs & Schmidt-Traub, 2015, seen in draft). ■

CONTEXT



CHAPTER I WHAT IS NEW?

MAIN POINTS MADE IN THIS CHAPTER

- ▶ There have been solid achievements in creating better financing systems for water; previous high-level reviews (notably the Camdessus (2003) and Gurría (2006) Reports) can take some credit for these. The formation of UNSGAB has helped to keep water high on the UN's agenda.
- ▶ The context of debate about water has changed with the growth of climatic concerns, awareness of corporate water risk, a more nuanced attitude to major water storage, and appreciation of the "Nexus" between water and energy, food and environmental issues. The MDGs are soon to be superseded by the SDGs, which are more comprehensive and costly.
- ▶ Many developing and middle-income countries have improved their economic status and are able to access commercial sources of finance, including bonds, for their infrastructure development.
- ▶ Except for certain Asian countries, commercial bank lending for water, including project finance, has been hit by the 2007/8 financial crisis and by changes in capital provisioning in banks.
- ▶ IFIs have developed their product range for infrastructure lending, and there has been a growth and spread of innovative financing mechanisms. There has been a huge growth in global savings seeking suitable outlets. In the world of PPPs, there is now greater selectivity by Western multinationals but a vigorous growth in private water operators from emerging economies.

A BRIEF HISTORY

In 2003 the (Camdessus) World Panel on Financing Water Infrastructure presented its report to the 3rd World Water Forum held in Kyoto, Japan. This report was a milestone in discussions of financing for water supply and sanitation, influencing the international agenda for the next decade and stimulating changes in the policies and practices of leading development finance institutions. Its main proposals were:

- ▶ Facilitating finance at the *sub-sovereign* level, where crucial water decisions are taken.
- ▶ Developing an array of *financial risk mitigation* products (e.g. financial guarantees) to encourage private equity and commercial lenders to support water projects.
- ▶ Encouraging *decentralised* finance at grass roots level by supporting NGOs and community-based organisations.
- ▶ Mitigating *foreign exchange risk* – a major deterrent to foreign financing of water – with a proposed scheme for liquidity support following major devaluations.
- ▶ Promoting the notion of *sustainable cost recovery* – including tariff revenues as well as budgeted government transfers – to sustain the necessary on-going flow of finance for water services.
- ▶ Formation of a high-level group of “wise persons” to monitor and report on progress on these and other issues involved in progress towards the MDGs.

There were many other proposals – 90 in all- for both governance and financial reforms. The report gave a crucial push to new policies, institutions and practices at the World Bank, the regional development banks, the EIB, and bilateral agencies, and was soon followed by the creation of special water facilities in the EU and AfDB.

In the immediate aftermath of the Camdessus Report (in March 2004) and in response to its call for the group of “wise persons” the United Nations Secretary-General’s Advisory Board on Water and Sanitation (UNSGAB)

was formed. The Board “advises the Secretary-General, raises public awareness and galvanises the action of governments and international organisations to advance the global water and sanitation agenda”. Sustainable financing is one of its core concerns, and, amongst other actions, it has advocated better access to local finance, blending of grant and loan funds, pooled financing facilities to help small borrowers, using ODA to leverage other types of funds, and increased local efforts at revenue raising and collection.

The Camdessus Panel was followed by the (Gurría) Task Force which reported to the 4th WWF in Mexico in 2006, focussing on building the capacity of municipalities to attract and manage increased financial flows for water. The Task Force also made recommendations for the finance of agricultural water needs.

HOW THE WATER DEBATE HAS CHANGED

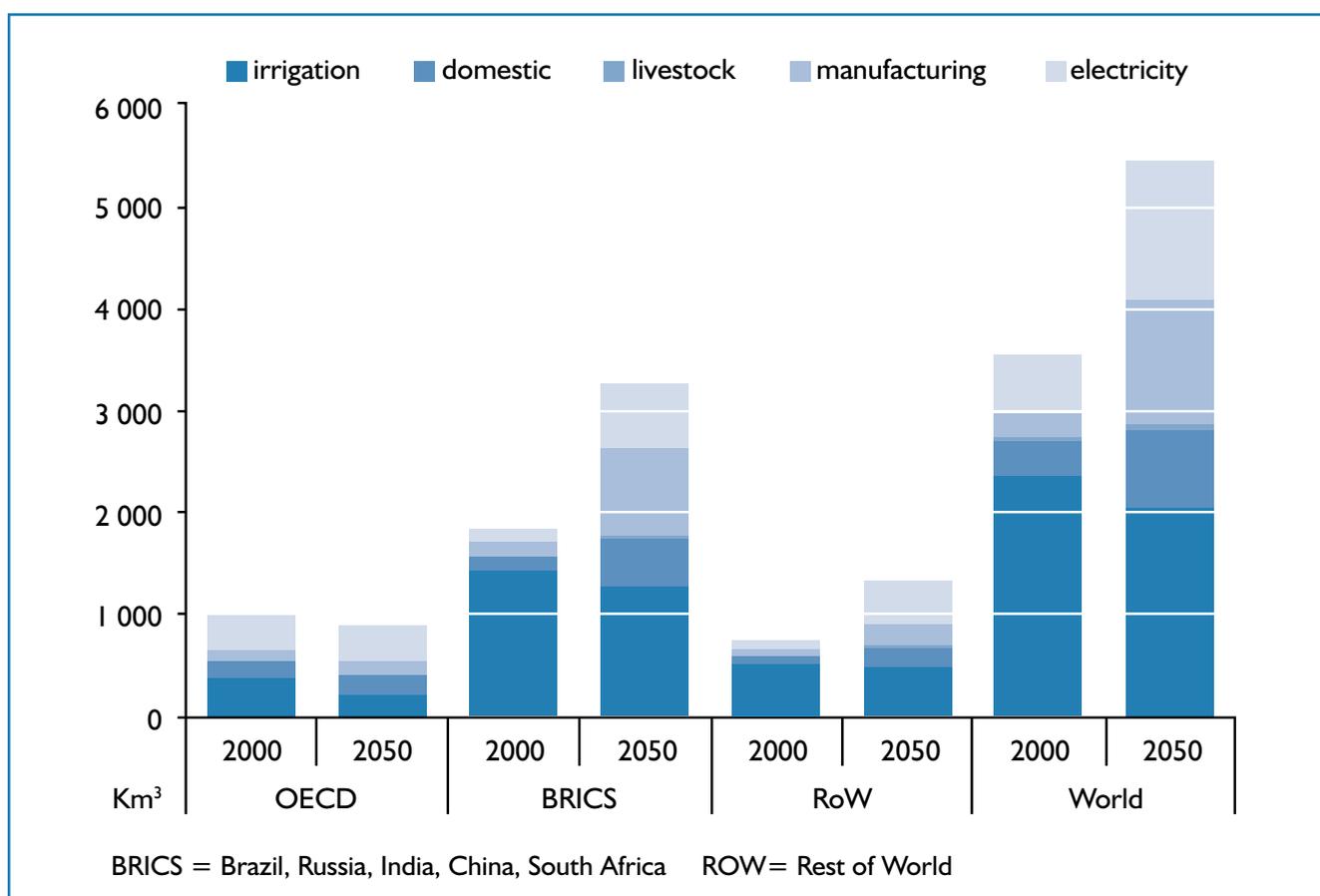
Over the past decade there has been a change in the way water is being debated in popular and professional circles, which is starting to feed into political and economic processes.

There is a better understanding of the *link between water security and economic growth* and how the risks and uncertainties of natural events can be managed. Many countries need no reminder of this since water has long dominated their lives and shaped their history. Now, however, the correlation between hydrology and economic performance³ through greater climatic variability and the more frequent occurrence of extreme events resonates more widely than before. Old and new water challenges are increasingly inter-twined, such as frequent floods and droughts, serious water shortages, environmental pollution and ecological degradation, and such problems are becoming common across all regions.

There is also widespread acceptance of the need for reforms in the governance & institutions of water. This is typified by the OECD’s Water Governance Initiative and the Principles of Water Governance which are one of its products. These Principles urge – amongst other

3 GWP/OECD (2015)

Box 1. Global water demand: Baseline scenario, 2000 and 2050



Source: OECD (2012), Environmental Outlook to 2050, OECD Publishing, Paris. Baseline projections; output from IMAGE

things - more transparency and less corruption, greater stakeholder involvement and the spread of river basin-scale management.

Scenarios of future water demand show the incompatibility between unrestrained growth in demand and the availability of water. In OECD scenarios, water demand is projected to increase by 55% globally between 2000 and 2050. The increase in demand will come mainly from manufacturing (+400%), electricity (+140%) and domestic use (+130%). (Box 1). There is, equally, evidence that the growth of demand can be moderated through the interplay of technological development and market forces including water prices: data from USA shows a fall in per capita water consumption despite economic growth.

Decisions about water cannot be made from within its own “silo”. Competition between different water

users is becoming a reality. The close interrelationship of water, food, energy and environment is symbolised by *the Nexus*. Policies made for energy self-sufficiency or food security for example are having unintended but detrimental effects on other water users.⁴

Climate change would have clear implications for water. Existing and planned new water infrastructure would need “climate proofing” (adaptation). It would also be under an obligation to mitigate its contribution to greenhouse gas emission through its inefficient use of energy. New infrastructure would need to reflect shifts in water availability and demand – a message which has resonated through recent high profile flooding and drought episodes in countries at both ends of the development spectrum. Viewed more broadly, investment in water infrastructure will help societies to adapt and become more resilient in the face of climate change.

⁴ Further explored in Waughray (ed.), 2013 and in WWAP (2014)

Attitudes towards *dams and water storage projects* have evolved since the 2000 Report of the World Commission on Dams. The debate is now more nuanced – focussing on questions of “where” and “what kind” of structures and “how to minimise their harmful side-effects”, superseding the earlier “pro and con” arguments. IFIs have resumed lending for dams, though this remains low compared with pre-2000 levels. Meanwhile, dam construction has continued apace, funded by national Governments and loans and export credits, particularly from China.⁵

Corporate business has been increasingly outspoken in warnings of the scale of water risks to its operations, and to economic growth in general. This has led to the development of metrics for the exposure of companies and financing institutions to “water risk” (*value-at-risk*). The concept of the Water Footprint of companies, sectors and entire countries has gained ground.

Water has acquired a prominent place in the Green Economy paradigm. Sustainable development, with lower Greenhouse Gas emissions and exerting less stress on the natural environment, implies better water management, more efficient water use, and reliance on nurturing “green infrastructure” such as catchments and wetlands to sustain water resources.

From 2015 the MDGs will morph into the Sustainable Development Goals – one of which is expected⁶ to be for water. These are more ambitious and broader in scope than the MDGs, costing more and implying new models of water service delivery.

The last decade has seen major studies leading to measurement of the huge potential investment required in water infrastructure in all countries. This has brought home the serious financing implications of global water security (OECD, 2006; McKinsey 2011, 2013, *int. al.*).

TRENDS IN THE FINANCE OF WATER INFRASTRUCTURE

The context for infrastructure finance, including water, has also changed in the last decade.

There have been improvements in the financial status and prospects of a number of developing and emerging countries due to economic growth and better macroeconomic management. Between 2005 and 2012 average GDP grew at 6.1% in developing countries (ICESDF, 2014, p. 8). Until recently, the BRICS and other emerging economies also registered high rates of growth.

Related to this, there has been growth in the credit standing of countries, as shown for instance in the growing number of countries issuing sovereign bonds (e.g. in Africa), and the number of countries able to issue bonds in their own currencies for international investors.

Major IFIs (e.g. the World Bank, AfDB, ADB, IADB, EBRD, EIB) have evolved new policies, structures and practices for water finance, and have restructured to facilitate such operations. China and several other emerging economies have become important financiers of dams and other water infrastructure. New sources of finance have been developed for climate change mitigation and adaptation. Green Bonds are starting to become a serious asset class for investors.

There is growing experience with innovative financing models at smaller scale, e.g. Output-Based Aid, Performance-Related Finance, and microfinance.

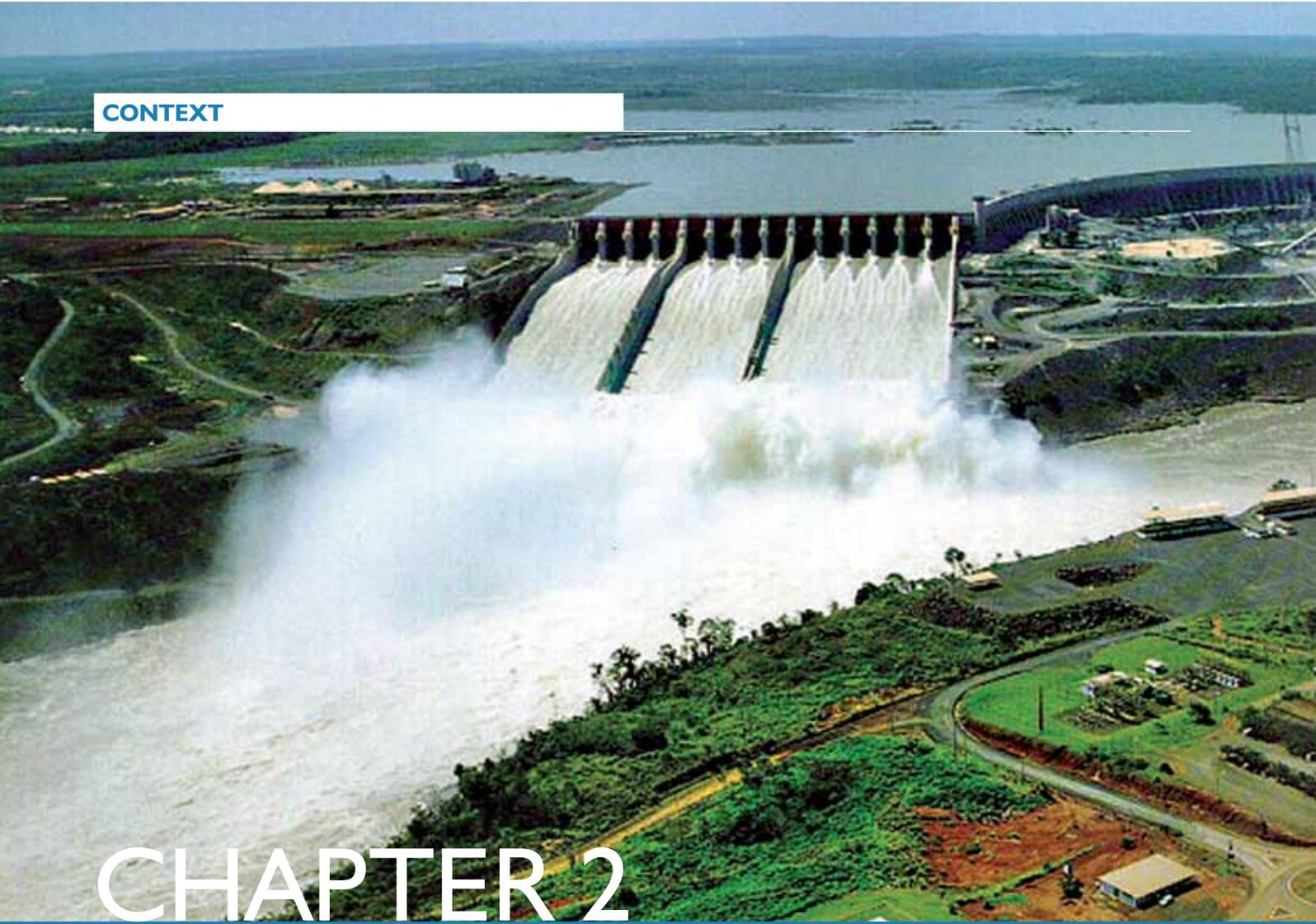
In the realm of private water services, there are signs of greater selectivity by Western water multinationals in their overseas ventures. This has been partially offset by the vigorous expansion of new companies from emerging markets, both in their home markets, and further afield. There has also been a shift towards more ‘asset light’ and less capital intensive PPP models.

⁵ The World Bank is currently funding 5 dams, the Chinese Export-Import Bank 300 (presentation by B.Braga, Stockholm International Water Week, Sept 2014)

⁶ To be endorsed by the United Nations General Assembly in September 2015.

Globally, there has been a huge growth of savings, currently estimated by ICESDF (2014, p.11) to be \$22 trillion annually) seeking safe and profitable outlets. This has swelled the coffers of institutional investors such as pension funds and insurance companies, Sovereign Wealth Funds and other financing institutions. Very little of this has so far been placed in infrastructure, and even less in water.

On the debit side, the 2007-8 international financial crisis dealt a blow to international lending from Western commercial banks, leading to a number of major banks scaling down their project financing operations. The collapse of major US monoline insurance companies has also affected the issue of insured municipal bonds in that country. The crisis also hit PPP projects in water sectors, though some recovery is now taking place. ■



CONTEXT

CHAPTER 2

HOW THE FUTURE LOOKS FOR WATER INFRASTRUCTURE

MAIN POINTS MADE IN THIS CHAPTER

- ▶ There are a number of different forces driving the future need for water infrastructure – growth of demand, changing consumption needs, addressing water pollution, growing water stress and greater climatic extremes, technological developments, the need for more environmental protection, the need to replace old systems, and others.
- ▶ Predicting future needs for water infrastructure is complicated by the number of these and the interactions between them. All that can be said with certainty is that Business As Usual cannot be used as the basis for prediction.
- ▶ This affects future cost estimations too. Eight of the more recent are reviewed, and their answers vary widely, depending on their scope, methodology, time periods and other factors.
- ▶ Financing needs of recurrent costs of O&M (opex) are a major, and growing, item which few of the estimations address. A failure to provide adequately for these will result in premature obsolescence of assets, deteriorating service standards, and higher capital costs in the long run.
- ▶ It is difficult to judge the step-change required in financing in the absence of firm estimates of the current levels of expenditure and sources of finance. Efforts are underway to address this issue, but need to be expanded in scope and intensified to provide the necessary baseline data.
- ▶ Investment at the level identified in the studies may be held back by factors other than the availability of finance. Financing is only one of the possible constraints, and in many cases may not be the critical one.
- ▶ A number of actions can drive costs down: O&M efficiency; low cost options (such as demand management) and green infrastructures.
- ▶ Governance matters. Stakeholders should be involved in decisions on the appropriate level of security and the respective shares of public authorities and other stakeholders in paying the bill. Transparency and accountability can minimise costs and enhance willingness to pay.
- ▶ With all important caveats, the studies reviewed lead to the conclusion that the future financial needs from providing adequate water infrastructure across the globe are likely to be substantially higher than the sums currently being spent.

THE DRIVERS

Looking two or three decades ahead, the future needs for water infrastructure are difficult to predict. Demand is growing fast, the behaviour of water users is changing, technologies are evolving and so are modes of service delivery. Overhanging all these is the likelihood of climate change, which could produce very different scenarios. The only certainty is that Business As Usual will be the wrong assumption for water planners to make in thinking about the future.

The future of water contains many uncertainties (“known unknowns”). To complicate predictions further, the drivers will interact with each other. A Delphi Survey conducted as part of the HLP, which included questions about the relative importance of different drivers, suggested that there is no single factor likely to predominate, with several likely to be important.

The main drivers likely to affect the future need for water infrastructure are as follows:

- ▶ Response of societies to the growing risks of water stress and drought due to pressure of populations and demand on water resources.
- ▶ Growing social, public health and environmental concerns with water quality, with implications for sewerage, wastewater treatment and treatment of industrial effluent.
- ▶ Increasing awareness of the value of ecosystems and biodiversity, the services they provide, and threats affecting them.
- ▶ Technological developments in the nature of water services and infrastructure. Many of these are already underway, and others are in gestation, yet more are inevitable but currently unforeseeable.
- ▶ The likely impact of climate change on water availability and demand, and implications for water security.
- ▶ Growing numbers of people exposed to risks of flooding and other extreme climate events.

Certain drivers will be felt particularly, though not exclusively, in developing and emerging countries:

- ▶ Extension of safe water and sanitation to populations currently unserved, in accordance with the proposed new Sustainable Development Goal for water.
- ▶ Population growth, rising living standards and changes in consumption habits and lifestyles (including greater urbanisation), leading to more water consumption per head both directly and through food intake.
- ▶ Premature replacement of plant, equipment and distribution systems due to neglect of essential spending on O&M, causing breakdowns and other malfunctions.

Other factors are more likely to apply to countries at higher stages of development with “mature” water systems:

- ▶ The need to reconfigure infrastructure in response to declining populations in the regions concerned due to de-industrialisation and other forces.
- ▶ The impact of metering, higher tariffs and more water-efficient installations on declining urban water consumption, causing financial problems for utilities with high fixed costs.
- ▶ Overdue need for replacement and rehabilitation of elderly infrastructure in mature water systems.

These drivers are reviewed and documented more thoroughly in WWDR (2014).

COST ESTIMATIONS

Estimations of the future costs of water infrastructure, summarised in Table I, come to very different results, due to differences in:

- ▶ subject scope – water infrastructure in its broad sense, or water supply and sanitation (WSS) only,
- ▶ geographical coverage (global, OECD, or developing countries),

Table I. Estimations of future cost of water infrastructure

Author(s)	Scope of study	Methods and sources	Annual costs US\$ billion
World Water Vision 2000	Water supply & sanitation, industry, wastewater treatment, irrigation, storage. Non-OECD	Based on (Briscoe, 1999). Includes 15% allowance for O&M	180 up to 2025; Roughly double assumed current levels
OECD 2006	Water & sanitation, wastewater collection & treatment, water resource development. Includes O&M. OECD plus BRICS.	Based on historic % of GDP deemed to go into investment into water, for different country development categories	772 by 2015 1037 by 2025
David Lloyd Owen 2010	Sewerage & wastewater treatment. Global	Detailed country by country estimates	Increase of 40-52 (2029) on current levels of 83.5
David Lloyd Owen 2011	Universal coverage of safe water supply, sanitation and sewerage. Global	Detailed country by country estimates	171-205 (up to 2050)
WHO 2012	Universal coverage of water supply & sanitation. Exc. O&M. Non-OECD	Detailed estimates of incremental cost in addition to the cost of achieving original MDGs	27 (Spread over 20 years after 2015) (water 10, sanitation 17)
McKinsey 2013	Water infrastructure (unspecified, but mostly WSS). Countries representing 90% of global GDP	Based on historical spending on infrastructure as % of GDP (water estd. to be 17% of this)	500-600 (2013-2030)
Booz Allen Hamilton 2007	Water (unspecified). Global	Regional estimates	900 (2005-2030)
World Bank 2010	Adapting specified types of water infrastructure to climate change (coastal zone protection, water supply, flood protection). Developing countries		75-100 (by 2050) Comparable to total annual ODA. As % of GDP, highest for Africa (0.7%), lower for other regions (0.3% or less).

- ▶ time period (up to 2030, 2050 or other, affecting annual averages)
- ▶ methodology (top-down from % of infrastructure investment to GDP, or bottom-up from detailed compilation of national estimates).
- ▶ different views of “needs”, leading to different proposed standards of service.
- ▶ Inclusion or exclusion of the costs of operation and maintenance (O&M), which can be a high proportion of the total.

In these studies there is no common or agreed focus on “broad water”. Key items such as hydropower development, irrigation and flood protection tend to be dealt with in studies pertaining to other sectors, such as power/energy, agriculture, and urban development. This complicates the task of estimating future costs of multi-purpose infrastructure.

The most robust estimates in Table 3 relate to the costs in developing countries for the extension of water supply and household sanitation to provide universal coverage by 2030, and the global estimates for sewerage and wastewater treatment.

The Sustainable Development Goal for water currently under discussion would have sizeable cost implications – for which there are not yet firm estimates. This is due to its adoption of higher service standards and the provision of facilities in schools and other public institutions, in addition to its adoption of the target of universal coverage.

Taken at their face value the financing numbers arising from these studies imply a much higher level of expenditure than is currently taking place.⁷ Moreover, studies based on historical relationships between investment in water and GDP are likely to *understate* future financial needs, insofar as past investment has been insufficient, and future investment will need to confront new challenges such as climatic change and variability.

It is also relevant to add that costs may be widely underestimated by the phenomenon of “appraisal optimism”, as has been recently reported in a study of major dams (Ansar *et.al.* 2014). (To place this finding in perspective, other kinds of infrastructure are also prone to this bias).

For perspective:

- i) By 2030, and even more so 2050, technology, modes of service delivery and the habits and needs of users will be different from today, perhaps radically so. Extrapolations based on current technology, service standards and use practices will be wide of the mark.
- ii) There is scope for savings in the more careful design and implementation of projects, and in the operating efficiency of water services, which could reduce both investment and operating costs. McKinsey (2013) estimated that global savings of 60% (or \$1 trillion per year) could be made from greater efficiencies in the major infrastructure sectors of transport, power, telecoms and water. Water might account for several hundred billion of these.
- iii) Water authorities typically have choices in the way they deal with water risks – including policy measures as well as infrastructure - and their options have different price tags. Examples of these choices are demand management versus supply augmentation, and “green” rather than “grey” solutions to protect against flood risks.
- iv) Corruption inflates the capital cost of infrastructure (typically by 10-30%, or even more) in many countries.

For the policy makers, some further points are important.

FIRSTLY, funding the recurrent costs of O&M is just as important as finding money for capital investment. These costs are often overlooked and underestimated. The most sustainable long-term source of their funding is from user charges, though government

⁷ Although the McKinsey (2013) projections imply future annual levels of investment in infrastructure “only” 60% greater than current levels. However, this result is an aggregation of all infrastructure types and does not necessarily reflect the specific needs of water.

subsidies may supplement these *pro tem*, where the national budgetary position permits. There is an inverse relationship between spending on O&M and that on major asset rehabilitation – the more O&M is starved of funds the greater the need for periodic rehabilitation, and *vice versa*.

Recent estimations from WHO (2012) of the cost of the MDGs for water and sanitation strongly suggest that focussing only on their capital investment cost is misplaced, and that an equally serious financing challenge is the high and rising annual recurrent costs of maintaining and replacing existing infrastructure (WHO, 2012, pp 42-43)..

SECONDLY, all the estimations have been made without a clear and agreed benchmark for the actual current flows of financing (recurrent and investment) into different kinds of water infrastructure and services. The on-going TrackFin project of GLAAS and WHO is an attempt to calibrate these flows. Another estimate (so far unpublished) by the Global Agenda Council on Water has been made, indicating that private outlays by domestic water consumers are fast approaching the scale of utility water bills⁸. Without a better understanding of water’s actual financial status it is impossible to gauge the size of the incremental effort implied by future estimations, though this is not to underestimate the size of the financing challenge to be faced.

The most robust estimates of *current* spending on water are of opex and capex⁹ expenditure by water utilities. A comprehensive survey by *Global Water Intelligence* covering all major countries (100 in all plus countries in 3 residual regional groupings) showed that in 2014 opex (O&M) spending amounted to \$317 billion, while capex spending was estimated to be \$216 billion. The higher spending on opex than capex is a striking result, with implications for the treatment of finance for O&M in this report.

THIRDLY, projections of investment “requirements” assume these would actually happen if they were

not constrained by financing sources. This is a very strong assumption. There are many factors holding back future investment in water infrastructure. The availability of finance is only one, and in many cases not be the most pressing, of these constraints.

FOURTHLY, and fundamentally, the costs of providing future water security depend on how water risks are allocated to different sections of society. This is a decision to be taken at political level, following extensive consultation with stakeholders through democratic processes or other channels.

A few examples illustrate this point.

Management of catastrophic flood risks is normally assumed by public authorities (e.g in Northern China, or the Netherlands) but lesser flood risk can be devolved to individual properties. Along the River Moselle in Germany and Luxembourg houses are built with basements as garages or storerooms, and living accommodation on upper floors in anticipation of periodic, but manageable, inundations from the river.).

In some countries (USA in the Mississippi Flood Plain, Netherlands, Australia, etc) farmers agree (in return for compensation) to allow their land to be flooded when necessary, as an alternative to building flood barriers.

In drought-prone areas households may have to assume the first risks of water shortage by investing in their own storage and supplementary supply sources. In irrigation schemes not all farmers can be offered 100% water reliability: those growing valuable crops can be made to pay more for preferential access to the water than others (the latter including “tail-enders” more distant from the intake) with less valuable or more drought-resistant crops, where intermittent supply would be less serious. The latter bear “residual risk” but could pay less for their water.

⁸ Global Water Intelligence, January 2015

⁹ Opex refers to operating and maintenance costs (O&M) and capex to capital (investment) expenditures

In short, the degree of water security pledged by public authorities (equivalent to the water risk they take on relative to other sections of society) will be a big influence on the extent and costs of the water infrastructure they provide. The more governments can devolve (“residual”) risks to other parties, the less the cost to the public purse (though the greater the cost to these other stakeholders), and *vice versa*.

A FINAL PERSPECTIVE

The estimation studies reviewed above provide a very broad order of magnitude of the possible annual costs of global investment in water infrastructure from now on. The very broad cost ranges are as follows (in US\$ billion p.a.):

Universal provision of water and sanitation MDGs **27-205** (WHO, 2012¹⁰, Lloyd Owen 2011);

Adaptation of water infrastructure to climate change in developing countries: **75-100** (World Bank, 2010);

Global sewerage and wastewater treatment: **123-135** (Lloyd Owen 2010);

Global - all water infrastructure categories: **500-1037** (OECD 2006, Booz Allen Hamilton 2007, McKinsey 2013)

With the exception of OECD (2006) the above figures are for capital investment only. Adding the recurrent costs of O&M would greatly inflate these estimates.

To place these estimates into perspective, the projected future cost of water infrastructure over the period 2013-30 of US\$11.7 trillion (McKinsey, 2013, p. 14) is of a similar order of magnitude to that for power (\$12.2 trillion.), smaller than that for roads (\$16.6 trillion.) and larger than that for telecommunications (\$9.5 trillion).¹¹

All the caveats made earlier in this section are important to keep in mind, not least the uncertainty over the amounts being spent at present¹². That said, the studies reviewed above are consistent with the conclusion that the future financial needs involved in providing adequate water infrastructure across the globe are likely to be substantially higher than the sums currently being spent. ■

¹⁰ These are for the incremental cost of extending services at MDG standards to the entire population. Insofar as the original MDG targets have not been achieved by 2015, the extra costs of achieving these would need to be added.

¹¹ Also, OECD (2006)

¹² For example, the estimated current level of investment in water and sanitation given in UNCTAD (2014) includes some industry and upper middle income countries and so cannot be used as the benchmark for the future estimates quoted above



CHAPTER 3

HOW WATER FINANCING WORKS

MAIN POINTS MADE IN THIS CHAPTER

- ▶ There is no “model” system for financing water. Each country follows a system born of its own distinctive features. Some common patterns can be observed. A number of national systems are clearly successful, and other partial initiatives are promising. Exchanging experience between countries is potentially valuable.
 - ▶ Water infrastructure takes many forms and this affects the appropriate form of financing in each case. A basic distinction is between water services that can be sold, and the provision of other types of services and functions which cannot.
 - ▶ The “3Ts” (Tariffs, taxes and transfers) concept should be retained, but it should be refined and developed to reflect new realities. Its basic idea of using sustainable cash flows to leverage repayable financing sources, with the help of “enablers and enhancements” is still a crucial insight for the way water services are financed.
 - ▶ The water financing “system” works through a variety of instruments and sources. It is a fluid and hybrid system, to be judged pragmatically according to whether it succeeds in providing finance of the right type in the right volume.
 - ▶ There are many sources of finance, both public and private, national and international, for water infrastructure.
 - ▶ A number of financing **instruments** are “elastic” in the sense that they have great scope for increasing in response to the flow of projects and financing propositions that suit their criteria.
- This applies to debt instruments (loans, including export credit, and bonds) and to a lesser extent equity. Climate finance and Green Bonds will increase, though not on a major scale relative to global requirements.
- ▶ The same applies to **sources**. Lending from state banks will remain important though may be constrained by macroeconomic pressures in several large countries. Commercial bank lending (and project finance more generally) is recovering from the 2007-8 international financial crisis but may not reach earlier levels for a while.
 - ▶ Municipal bond issue and other methods of funding urban infrastructure are likely to become increasingly important. Institutional investors such as pension funds and Sovereign Wealth Funds, plus other funds, have a large potential appetite for good infrastructure securities that meet their investment criteria.
 - ▶ IFIs, though a minor source in absolute terms, have a disproportionate influence through their “halo” effect on other lenders, as well as the range of products and value-added they can bring. IFIs should be able to make greater use of their balance sheets to leverage a wider impact.

A PREAMBLE - WATER RESOURCES, INFRASTRUCTURE AND SERVICES

Any discussion about the financing of water infrastructure can quickly cease to be useful unless it focuses on specific categories and items. “Water infrastructure” takes many forms and needs finance at every point of the cycle from collection, storage, transportation, treatment, distribution, “end use”, and waste treatment. River basin management, including flood protection and environmental conservation are other important budgetary categories. Each of these categories has different financing potential and modalities, even where several processes are co-managed by a single institution, such as a river basin authority, a hydropower plant or a water utility.

The most basic distinction is between water *services* provided to specific users, which in most cases can be sold, and other *functions* which cannot easily be monetised. This latter category includes water resource management and development, the creation of strategic infrastructure for storage, flood protection, ecosystem preservation, etc. Many of these functions are *public goods*. By definition, multi-purpose infrastructure (MPI) provides a number of services and functions simultaneously.

Water *services* can potentially draw on a wide range of financing modalities, from both governments and commercial¹³ sources. Financing options for water resources management and other public goods are more limited. Major projects of water infrastructure with long term strategic benefits, including MPI, will normally need underpinning with public finance, with the deal possibly structured to include participation by private investors and commercial lenders.

With this preamble, the chapter begins with a broad review of water financing to provide a context for the following discussion.

A BIRDS’ EYE VIEW OF GLOBAL WATER FINANCE

From a global perspective, there is no general pattern of water infrastructure financing. Models and solutions are highly country-specific, and characteristically eclectic. This is not surprising, since the management of water is the product of the history, geography, culture and economic circumstances of each country, and the way it is financed reflects this diversity.

Box 2. Eclectic financing solutions

“...the financial instruments need to be diverse because the technical solutions are different and the affordability of the population is also different. This means that there is no general pattern of water infrastructure financing. Models and solutions are highly country-specific and characteristically eclectic.”

From a paper by Jaime Melo Baptista for the HLP, 2014

That said, certain features are discernible; some national “systems” are in place, and in other cases “models” of finance exist for certain types of water infrastructure. Most countries have hybrid systems and make pragmatic choices of financing modes.

The typical national structure is segmented, with different water sub-sectors having their own funding models and sources. This is not necessarily a problem, though it may be beneficial to introduce some coherence to a highly fragmented system. In Mexico CONAGUA, supported by the World Bank, is attempting greater coherence through the *Sistema de Financiamiento del Agua (SFA)*¹⁴. Implementing the SFA would not only improve the financing of Mexico’s water infrastructure, but it would also promote more integrated and coherent water management.

The following illustrates the variety of water financing systems in place, starting with typical **models and financing vehicles**.

¹³ The term “commercial” is preferable to “private”, since a sizeable proportion of commercial banks and other financial institutions are in public ownership.

¹⁴ Campanaro & Rodriguez, 2014

Coherent systems of water finance with a high degree of cost recovery from users. France, organised into six river basin organisations (*Agences de Bassins*) follows the philosophy of “water pays for water”. The Netherlands also has comprehensive mechanisms for recovering the costs of its water infrastructure and services (OECD, 2014). The 28 member countries of the European Union are required by the Water Framework Directive to aim at recovering the full economic and environmental costs of existing assets from water users through tariffs, abstraction charges and pollution charges (though many of these assets were originally subsidised from public funds).

Infrastructure finance mainly provided by Government budgets and long term loans on concessional terms from state banks. This is a common system, exemplified by China, Brazil, Mexico, India, Turkey, and many other countries. Until now, this has also described the USA, where major schemes executed by the Army Corps of Engineers have been funded by federal, state and local budgets. In developing countries it is estimated that 75% of finance for water investment is provided from public sources (Rodriguez *et.al.* 2012).

Responsibility of private operators for the finance of water services. At one extreme are England and Wales¹⁵, the ‘regulated utilities’ in the USA, and a number of companies in Chile where water supply infrastructure has been fully divested to private owners with finance raised from market sources and repaid from tariffs. (In England flood management is the responsibility of the public Environment Agency, funded from general taxation). France relies on long-term private concessions for the use of publicly-owned infrastructure, with concessionaires providing some financing of the infrastructure they use. Other countries as diverse as USA, Brazil and China use Public Private Partnerships for individual water systems, covering a minority of their populations (20-30 percent of the urban population in Brazil and China).

Municipal bonds. Bonds have been a traditional means of financing urban water services in large cities of Europe and North America and elsewhere (with tax-exempt status in the USA). Smaller towns and

cities have pooled their resources in some cases to share a single bond issue (e.g. Tamil Nadu in India, and Colombia).

Use of a dedicated water financing institution. The Netherlands Water Bank is the best known case of this. Elsewhere it is unusual, though many countries have banks devoted to financing infrastructure of all types. The French River Basin Agencies operate as financial agents, as they recycle revenues from water charges to invest in water infrastructure.

National revolving funds. Revolving funds involve “pump priming” by central government to stimulate borrowings by municipalities or utilities, creating revenues from loan repayments which are further on-lent. The USA and the Philippines (Paul, 2011) have successful schemes of this nature.

Microfinance and other types of small-scale finance. There is great variety in the means of providing small amounts of finance – to users, informal service providers, small water companies, etc. Some of this is through banks, some through specialised microfinance institutions, and some through informal channels.

Self-finance by water users. This is widespread, and takes many forms. It is estimated that in developing countries households themselves invest more in water and sanitation services than governments or donor agencies (Tremolet, 2012). Urban households with connections to a distribution system buy extra storage and treatment facilities to compensate for failings in public services; households in informal settlements buy water from private vendors; rural households dig their own wells or buy from others; industries and isolated enterprises and farms create their own supply systems, etc. In developed cities, households share the cost of water-saving or other “green” devices.

In relation to financing schemes for **different types of assets**, the following features are typical:

Large surface irrigation schemes. These are often financed by governments, with the help of IFIs, though globally a substantial portion of irrigated land is owned and financed by private estates and individual farmers.

15 Other parts of the UK (Scotland and Northern Ireland) have their own systems. Glas Cymru Cyf (Wales) is a privately owned not for profit company.

Groundwater irrigation systems are overwhelmingly privately owned and financed.

“Greenfield” projects financed through BOT-type concessions. This is very common for stand-alone projects for potable water treatment (especially desalination), and wastewater treatment plants, in all parts of the world, especially the Middle East and SE and East Asia.

Wastewater collection and treatment. Sewers and wastewater treatment plants (WWTPs) are normally funded by urban utilities or municipalities using tariff revenues, supplemented by local taxation. In some countries, building WWTPs, decontamination of polluted water bodies, etc. is funded partly or wholly from pollution charges, following the Polluter Pays Principle. This is common in some Central and Eastern European countries, where revenues from pollution charges are earmarked for spending on anti-pollution purposes.

Multi-purpose infrastructure and other large structures (e.g. dams, conveyances). These major schemes normally involve a basket of funding comprising public equity, grants and loans, export credits, commercial loans from local or foreign banks, plus donor support¹⁶ for specific elements. These projects often have a strategic purpose (drought resistance, flood control, regional development etc) and provide public goods (navigation, river basin management, maintaining “ecological” river flows, etc) that justify a large element of public funding. The large sums involved, together with the site-specific nature of these projects, tends to make each project financing unique.

Water Resources Management (WRM). The cost of WRM commonly falls on central government budgets¹⁷, though some of these are offset by charges on water users through Abstraction Charges or fees for specific services. As noted above, France and Netherlands have systems for recovering a high proportion of these costs from water users, while South Africa also has a system of charges to fund WRM. (See also the next item below).

The funding of catchment management and protection of aquatic ecosystems. The management and protection of such “green infrastructure” as water catchments, wetlands, deltas, etc. tends to fall by default on public funding. It is estimated that in 2013 US\$9.6 billion was invested globally in watersheds and other water-critical ecosystems, of which 90% came from public subsidies. The remaining 10% came from utilities, businesses, collective action funds and bilateral deals such as water funds (Bennett & Carroll, 2014). Local schemes (notably Payments for Environmental Services) involve the transfer of money from beneficiaries (e.g. downstream users, or hydropower companies) to land users who need compensation for changing their practices. In Latin America there are a number of Water Funds set up for this purpose.

funding of the recurrent costs of operation and maintenance of water services. The O&M costs of water services to households, industry, public institutions, farmers, hydropower companies, etc. are normally covered by tariffs charged for the water, with any deficit made up by public subsidy. The recurrent cost of providing *public goods* is normally borne by taxation, offset to some extent by various *ad hoc* measures of fundraising from beneficiaries.

¹⁶ In countries eligible for finance on concessional terms.

¹⁷ OECD (2012) has examples from Europe. Winpenny, Hall & Lindgaard-Jorgensen (2012) contains practices in some sub-Saharan African countries

THE 3TS – CREATING THE CASH FLOW TO LEVERAGE REPAYABLE FUNDING

The concept of the “3Ts”, developed by the OECD (2009), has become a common way of approaching discussions of the financing of water services, with particular reference to water supply and sanitation. In simple terms, it states that all water financing is based on a cash flow made up from Tariffs, Taxes (subsidies) and Transfers (from aid or philanthropy). This cash flow covers the recurrent costs of water and helps to finance that part of its capital investment which is funded from repayable sources – loans, bonds and equity.

The 3Ts arose in response to the fallacious idea that private/commercial (i.e. repayable) finance could substitute for a shortage of internally-generated funds or public finance. In reality, repayable funds are limited by the size of future cash flow from the 3Ts, and their repayments pre-empt part of these cash flows¹⁸. The 3Ts also focussed thinking on the relationship between each of the 3 strands of basic finance, and between these and the repayable sources, and the essential differences between each of these.

In practice, the use of future cash flows to leverage repayable funding for investment is already widely employed. It is the principle behind the USA's *tax increment financing* system

Box 3. Revisiting the 3Ts

The 3Ts concept could usefully be updated to reflect the following factors:

- i) **Socio-economic circumstances.** One of the 3Ts – aid and philanthropy – is only important for those developing countries still eligible for these funds. For most other countries, including all OECD members, there are in practice only 2Ts, namely tariffs and tax-funded subsidies (although EU member states have been able to draw on generous Structural Funds for water infrastructure). Some developed countries practising full cost recovery from users effectively use only 1T, namely tariffs. Across different countries there is a rough positive correlation between their level of economic development and the size of tariffs relative to subsidies.
- ii) **Sub-sectoral variations.** The relevance of the concept varies between different water sub-sectors. The 3Ts has less resonance in irrigation, where irrigation user charges are commonly low or negligible, and where subsidies are high and ubiquitous for both O&M and capital investment¹⁹. Nor is it always practical to levy tariffs directly for such kinds of water infrastructure as public sewerage, urban stormwater drainage, or wastewater treatment.
- iii) **Trends in consumption.** While at lower levels of development, water consumption per head rises with growing living standards, in a number of developed countries average consumption is starting to fall due to the spread of water-efficient devices, metering, and other factors. This affects the revenue base of the provider and its ability to repay existing loans. Other sources of revenue may be needed to supplement declining tariff revenues in these cases.
- iv) **New kinds of Ts.** Taxes, for instance, are not homogeneous. Chapter 6 discusses the use of the Public Goods Charge in California, a levy on energy and water bills to fund specific types of *public goods*.
- v) **New types of financial contribution.** Certain types of financial contributions, in addition to the 3Ts, are growing in importance. In an urban context these include revenue sources (taxes, local rates, betterment levies, capital gains taxes, etc) linked to the growth in property values associated with (and partly caused by) the expansion of public services of which water and sewerage is a part. The sale of surplus public land is another potential source of funds. Property developers can be required to build local water and sewerage networks for their estates, and/or pay financial contributions to public authorities to defray these costs (OECD 2015a). In short, extracting the *economic rent* from growing cities could be called the 4thT. Remittances from relatives working overseas are also important inputs to the creation of water facilities for households and farms.
- vi) **Self-finance.** Water users themselves contribute to costs in ways other than tariffs, such as farmers paying for their own pumps or investing in water-saving technologies, and households buying water tanks and filters, paying for their own latrines and septic tanks, and buying supplementary water from private vendors. Business users also have a choice between taking public services and providing their own, at private expense.

¹⁸ Repayable finance does enable capital investment to take place earlier, compared to a situation where investment is financed wholly from the surpluses from current operations, which in any case is illegal in some countries.

¹⁹ although farmers do invest their own resources, both financial and in “sweat equity”, in their land

for municipal bonds, in Peru's *Fideicomiso* for securitisation of utilities' cash flows, and – more generally – wherever a bank, bond or equity investor takes a lending or investment decision on the basis of the future revenues expected from a project. In this respect, the 3Ts concept is already firmly imprinted in the mentality of financiers of revenue-earning projects.

Having said this, it is timely to revisit the 3Ts concept, for several reasons.

This Report therefore recommends:

- ▶ The simple typology in the 3Ts needs to be finessed to make it more realistic and to reflect certain important complexities. It should, however, retain the key distinctions between cash flows and repayable sources, and between national and international funds. New sources might be included as sub-categories of the existing 3Ts. The typology should encourage a focus on the *relationship* between the different types of finance.
- ▶ A starting point in reformulating the typology could be identifying the *value streams* created by water, who benefits from this, and how these benefits²⁰ can be used as the basis for cost recovery²¹. For example, if urban water infrastructure benefits property developers, and flood protection specific households, then it would seem reasonable to require contributions from these parties. Conversely, insofar as urban stormwater drainage confers a *public good*, some contribution from general taxation would seem appropriate.²²

Figure 1 illustrates how revenue-earning projects or water utilities can use their expected cash flows to attract repayable funds, enhanced through various “enablers” and levers.²³

In the abovementioned model, generating the finance for future needs consists of:

- ▶ Maximising cash flow in order to cover recurrent costs and provide a surplus for capital investment.
- ▶ Increasing the “pulling power” of this cash flow to leverage repayable finance in the form of loans, bonds and equity, through creating “enablers” and “enhancements”.
- ▶ Securing the necessary repayable financing from external sources.

The concept of Strategic Financial Planning (SFP) incorporates this approach for use in the longer term planning of water finance. SFP entails “taking a long term perspective of the financial needs of the sector, the factors affecting them, the main sources of funds and the balance between them, and how needs can be reconciled with potential resources.” (OECD, 2009, p.10). This process has been tested in several countries, using computerised modelling for the development of different scenarios (EUWI, 2011 & OECD, 2011c).²⁴

20 In economic terms, *consumer surpluses, producer surpluses and economic rents*

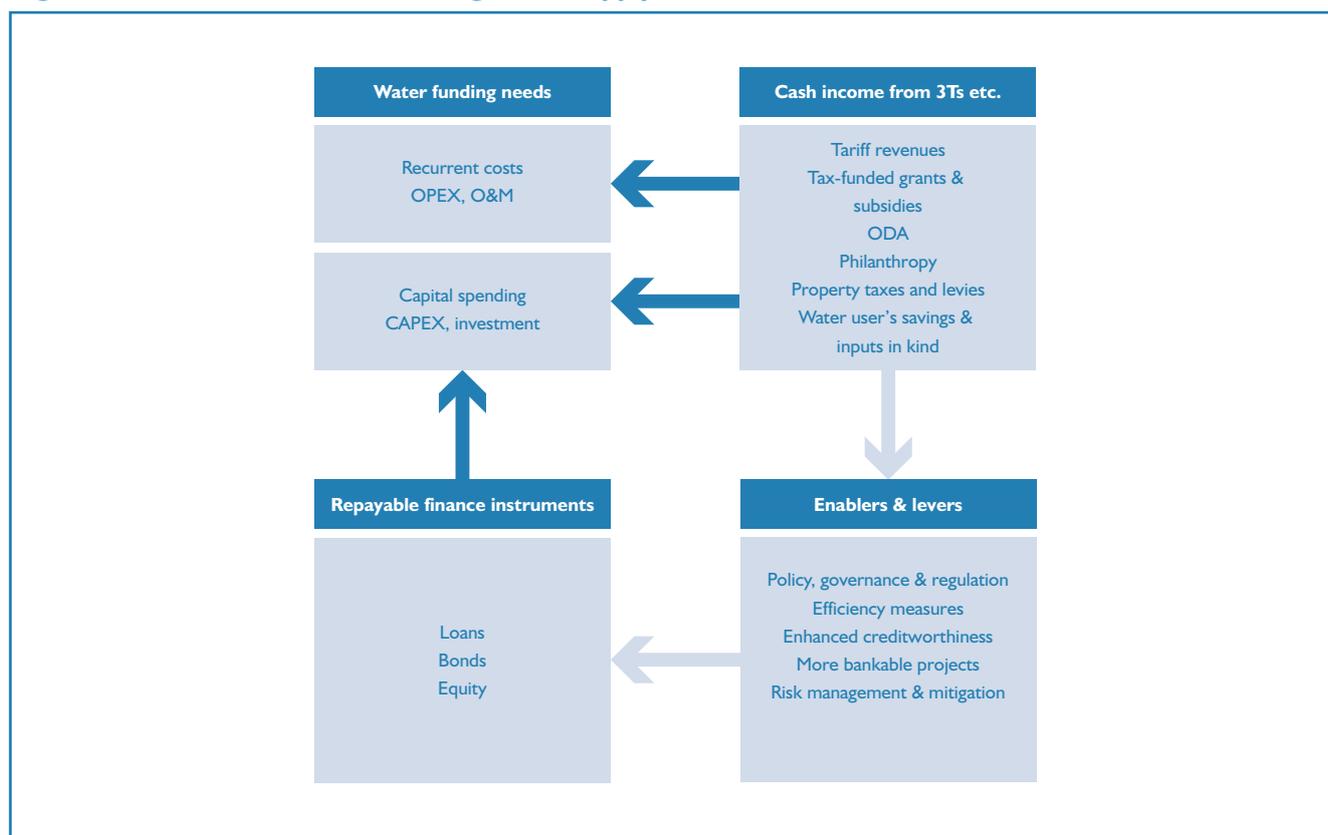
21 see the 4 principles for WRM financing; OECD,(2012)

22 Though some urban authorities are imposing levies on owners of sealed surfaces (households, commercial malls, cities themselves) in proportion to the degree they are deemed to aggravate such run-off, e.g. the French Tax on Impervious Surfaces. For more information, see OECD (2015a).

23 The approach would need modification for use in water sub-sectors other than water supply and sanitation.

24 see multiple examples developed in the context of the OECD EAP Task Force, in Eastern Europe, the Caucasus and Central Asia. Also OECD (2009) which includes a description of the computer-based FEASIBLE tool (p.65)

Figure I. The Basic Model of financing water supply and sanitation services



FINANCING WATER RESOURCES MANAGEMENT (WRM)

The OECD Framework (Box 4) provides the basic principles in approaching the financing of WRM.

Box 4. The OECD Framework for financing water resources management

Four principles provide a framework to help governments ensure adequate financing is available to effectively manage water resources:

- ▶ **The Polluter Pays** principle creates conditions to make pollution a costly activity, to alleviate pollution, and compensate for welfare loss. In a water security context, the point is that those liabilities should cover the costs.
- ▶ **The Beneficiary Pays** principle allows for the sharing the financial burden of water resources management across public and private actors.
- ▶ **Equity** is often invoked to address affordability

or competitiveness issues, when water bills are disproportionate with users' capacity to pay.

- ▶ **Coherence** between policies that affect water resources is essential to ensure that policies are mutually supportive and do not work against each other.

Economic instruments such as abstraction and pollution charges or water pricing have a pivotal role to play in financing water resources management. Available evidence highlights that they are most effective when due attention is paid to their design, the way they interact with other instruments, and the institutional and governance structures within which they operate.

Source: OECD (2012), A Framework for Financing Water Resources Management.

PUBLIC, CORPORATE AND PROJECT FINANCING

The type of funding and its source largely depends on the status of the body seeking to raise finance. To simplify, one can envisage three broad categories:

Public finance is appropriate for a public body (central government, municipality, publicly-owned utility, parastatal or water authority relying mainly on public finance or guarantee). Such bodies can draw on public finance from annual national budgets, allocations from national investment programmes, and guarantees enabling them to raise funds on their own account (e.g. municipal bonds), and other forms of public support. They can also benefit from external ODA, IFI or other loans routed through national governments, who on-lend these external resources to their sub-sovereign bodies, while underwriting the payment and forex risks that may be entailed.

Box 5. Project Finance²⁷

The market for project finance differs markedly between major regions, and between individual countries within them.

Globally, the volume of project finance in 2013 was \$418 billion, a slight increase on the previous year. Within this total the main items were loans (\$297 billion) and bonds (\$54.7 billion).²⁸ Bank lending still predominates in many regions, especially in Latin America through government-owned banks, and in members of the Gulf Cooperation Council. Asian infrastructure finance is also dominated by banks, of which the Japanese are still expanding in this area.

However, in Europe and North America, bank lending for infrastructure has declined markedly since the financial crisis of 2007-8 and the evolution of international regulatory standards under the Basel III accord, which raises the amount of capital provision required to set against risk-weighted assets. Banks are also required to provide a greater “maturity” match between the terms of their borrowing and the terms of their lending, which will make lending for infrastructure more costly for them. The Eurozone financial crisis since 2010 has also had a negative impact, both on project finance in Europe, and in the other regions

It is likely that much of the funding for implementation of the proposed Sustainable Development Goals, particularly for water and sanitation, will be from public finance, including external ODA (UNCTAD, 2014; Sachs & Schmidt-Traub, 2015).

Corporate finance is an option for a corporate body (private company, commercialised²⁵ public utility or parastatal) which can leverage its own balance sheet by raising loans, bonds or new equity share issues on the strength of its own assets and financial resources. Listed companies²⁶ with a good credit rating are well placed to raise this kind of finance. However, even large and financially strong companies and utilities may opt for project finance (see below) in respect of projects carrying a degree of risk, in order to ring-fence their balance sheets from any losses incurred by the project, and thereby maintain their credit rating).

where European-based banks were active, especially in the Western Hemisphere.

The financial crisis also affected the issue of bonds to finance infrastructure. The previous practice of guaranteeing bonds against default through the “monoline” insurance companies has sharply declined following the latter’s financial problems, causing many of them (e.g. AIG) to leave this market.

Some banks have abandoned project finance completely; those remaining have found it less profitable and their customers are finding it more expensive. Even so, there are signs that the project finance market is recovering - though the supply of finance is increasingly coming from non-bank sources, especially “institutional” lenders and investors (life-insurance companies, pension funds, hedge funds, sovereign wealth funds, finance companies, etc.). Large public sector pension funds in Canada and the USA are already major holders of project finance equity, and are increasing their involvement in lending too. The key to attracting more of such finance into infrastructure projects is to enhance the credit rating of the projects themselves up to investment grade.

²⁵ With a remit to break even and earn a financial surplus

²⁶ Including companies with both public and private share ownership, such as SABESP, the water authority for the state of Sao Paulo in Brazil.

²⁷ This box draws on Yescombe (2014); EIB (Dec 2012); Standard & Poor’s (Jan 2014); and McKinsey (Jan 2013)

²⁸ S&P (*ibid.*, 2014)

Project finance is raised from the assets and cash flow of a specific project, for which a Special Purpose Company or Special Purpose Vehicle is formed. It is “off balance sheet” and “non-recourse” finance, in the sense that, in the event of bankruptcy or other reasons for non-payment of debt, creditors do not have recourse to the balance sheet of the parent or sponsor, and their claims are limited to the assets of the SPC/SPV. Large and complex projects typical of water multipurpose infrastructure are normally carried out using public finance, project finance, or a hybrid of the two (See Box 5).

THE MAIN TYPES & SOURCES OF FINANCE FOR WATER

This section presents the main sources of finance under three general categories, corresponding to whether they contribute recurrent funding, provide repayable funds in the form of loans and bonds, or provide equity (Table 2).²⁹

At a global level, banks are by far the largest potential source of investment finance, with total assets, stocks and loans valued in 2012 at (\$ trillion) 121, followed by pension funds (34), insurance companies (26), direct investment by transnational corporations (25) and Sovereign Wealth Funds (6.3) (UNCTAD, 2014, p. 154).

Table 2. Categories and sources of finance for water

3Ts & other contributions to recurrent finance	loan & bond finance	Equity finance
Tariffs & user charges	Public development banks	Institutional investors
Taxes (national budgets)	Commercial banks (inc. project finance)	Sovereign Wealth Funds
ODA	Institutional investors	Specialised water funds
Philanthropic funds	Sovereign Wealth Funds	International Financial Institutions
Property taxes & other levies & contributions	Public bond issue	Private equity funds
Self finance by users	International Financial Institutions	Venture capital
	Project Bonds	Public-Private Partnerships
	Microfinance	Individual shareholders
	Climate finance	
	Export credits	
	Individual bondholders	

²⁹ Some sources of finance contribute loans, bonds and equity. These will only be discussed once, to avoid repetition.

I. THE 3TS & OTHER CONTRIBUTORS TO RECURRENT FINANCE

Tariffs & other user charges

Tariffs are the principal means of funding the recurrent (O&M) costs of water supply and sanitation, but in most countries they make little or no contribution to investment costs³⁰. This is the main message of the latest IBNET Blue Book³¹, collating data from 1861 utilities serving 12480 towns and cities, mainly in countries receiving World Bank support. Tariffs in 37% of these utilities did not cover O&M costs in 2010, with even higher rates in lower-middle and low income countries. O&M costs have risen from a median of \$0.28/m³ in 2000 to \$0.75/m³ in 2010, reflecting higher wages and power costs. From the viewpoint of affordability, the median tariff accounts for 1.47% of household income in a low income country, against 0.60% in a high income country

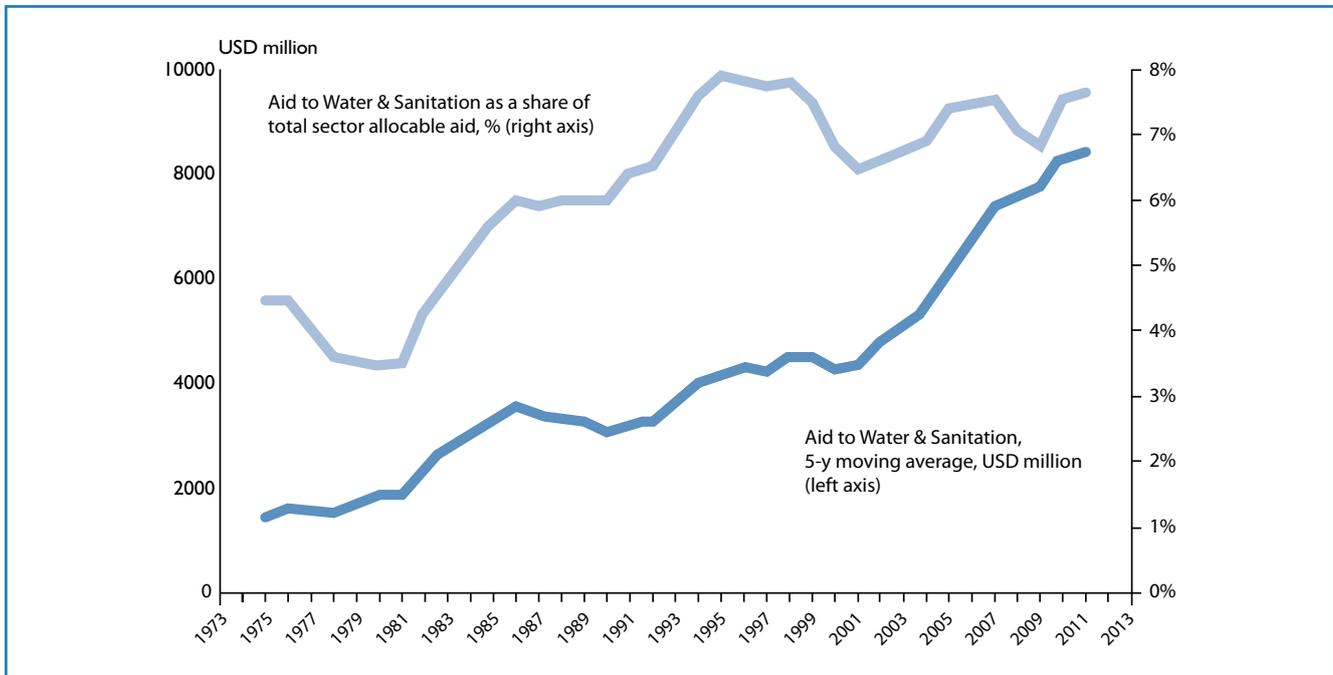
Taxes & national Budgets

Public grants and subsidies are a major source of funding for water, in various forms – covering financial losses incurred by utilities in selling water at less than the cost-recovering tariff, in providing grants towards capital investment and for annual costs of water provision, and providing sovereign guarantees³² for borrowings by sub-sovereign water entities. In many countries the rising fiscal cost of both water and power subsidies (which are often intertwined in the price of power for irrigation pumping) is becoming unsupportable.

Official Development Assistance (ODA)

The trend in ODA for water supply and sanitation from members of the OECD's Development Assistance Committee is shown in Chart 1. In 2012 commitments by both bilateral and multilateral sources totalled close to \$10 billion. However, due to the protracted disbursement of funds, typical of this sector, actual spending was only c. \$7 billion.

Chart 1. Bilateral and multilateral aid to water supply & sanitation



Source: OECD Development Assistance Committee. Data provided to HLP. Commitments of bilateral ODA and concessional elements of multilateral aid.

30 Although the source is now somewhat dated, only 30% of global water utilities reviewed in Komives et.al. (2005) made even a partial contribution to capital costs, on top of O&M.
 31 International Benchmarking Network for Water and Sanitation Utilities (2014): *Blue Book*. World Bank. For commentary on this report see article by David Lloyd Owen in *Global Water Intelligence* November 2014.
 32 These guarantees represent a *contingent liability* for Central Governments, which should appear in public financial statements.

“Solidarity” schemes have philanthropic aims, but when enshrined in the law become “official”. One of the best known is the French *Oudin-Santini* Law which allows (but does not mandate) local authorities to exact a levy of 1% on water bills with the proceeds going to aid for overseas water projects,

Philanthropic Funds

A large number of non-governmental organisations (NGOs) are involved in financing and operating water projects of all kinds, particularly in developing countries. They act for a variety of motives, and take many forms: religious organisations, NGOs specialising in development or specifically WASH, corporate philanthropic funds (e.g. Rockefeller, Gates), etc. Programmes of Corporate Social Responsibility operated by large businesses could also be included in this category. One of the largest of these programmes, the Bill and Melinda Gates Foundation, reported spending of US\$90 million in 2013 on water, sanitation and hygiene projects. In all, philanthropic donations to development programmes are estimated to be of a similar order of magnitude to total ODA.

Property taxes & other levies & capital contributions

Property developers & house owners are increasingly involved in financing water distribution systems, household connections, storm water collection and storage, and other parts of urban water infrastructure. This is an important trend in the context of increasing urbanisation.

In a number of countries³³ construction firms are building water systems using private capital, and maintaining ongoing service contracts to finance this capital. In other cases home and land owners are investing their own capital (or borrowing on their own account) to build decentralized systems for single-family or multi-family complexes (e.g. in Brisbane, Australia³⁴). In Mexico, the largest source (22%) of investment funding for water supply and sanitation after the Federal Government is housing developers, building water and sewerage systems within their

developments. These construction companies have greatly increased their investments as part of large subsidized housing programmes initiated in 2001 (Campanaro & Rodriguez, 2014).

Self-finance by water users

Households, farmers and businesses regularly spend large amounts of money to secure their water and sanitation services. In the words of one leading analyst, “Households in developing countries invest more than donors or governments in water and sanitation services” (Tremolet, 2012). This applies to consumers who are connected to public services, but who need to spend extra to compensate for the failings in these services. But it applies even more to consumers outside the reach of public service networks, who have to make their own provision, including buying at high unit cost from private vendors. It also applies to farmers, especially those reliant on groundwater pumping.

Housing and property developers are likely to have incentives to invest in decentralized systems to raise the value of their property. In Australia research by the largest national property website³⁵ has revealed more vendors are seeing “green credentials” as selling points, since one in ten people are prepared to pay up to 20 per cent more for a ‘green’ home. With mounting concerns about water supply and sustainability, properties offering water security are becoming more popular (e.g. water tanks enabling rainwater harvesting, which in France is highly rated by the public as a positive contribution to “green” building).

Financing urban drainage can also be deflected onto developers. In the UK it has been shown how urban planning controls can improve storm water management and reduce run-offs, while also transferring costs from the sewerage provider onto local developers³⁶.

33 Currently (2015) Spanish firms are particularly active, both in Spain and overseas.

34 Quoted in OECD (2015)

35 www.realestate.com.au

36 Quoted in OECD (2015)

II. LOANS AND BONDS

From the borrowers' point of view, the key features of different *debt instruments* are their interest rates, their repayment period or date (*tenor*), whether they have *grace periods* before repayment starts, the *security* (collateral) required, and their *conditionality* (actions to be undertaken by the borrower as a condition for getting the funding).

For water infrastructure all these features are important, but an overriding decision is whether repayment is to be in foreign exchange or local currency. This is crucial, since the revenues of water investments are normally received in local currency. If repayment has to be in foreign exchange, the borrower is at the mercy of exchange rate movements. Devaluations have fatally undermined several flagship international water concessions.

Most developed countries and some of the larger emerging market economies have capital markets that are sufficiently developed to provide local currency finance for infrastructure – though this is more typically from state banks than private commercial banks. Obtaining local currency loans from international banks, and even IFIs, is more difficult, unless these sources can raise funds locally.³⁷

Public development banks

Large state-owned banks underpin major strategic infrastructure projects in many countries. They typically lend for longer term, and at lower interest rates than their private counterparts, and often have a specific remit to support projects of a strategic nature that fail to attract enough funding from private capital markets. Brazil's national development bank BNDES, which has larger annual lending than the World Bank, lends to infrastructure (including some major dams) at a subsidised rate (currently 5.5%) in relation to the central bank's short term rate (SELIC) of 11.75%³⁸. BNDES is one of the channels for workers' employment insurance funds.

In Brazil, China, India, Mexico, Indonesia and other countries public development banks are used by governments as a tool of economic policy, and macroeconomic pressures partly dictate the pace of this lending. There are concerns in some countries about the size of indebtedness of state banks, and growth in their bad debts.

Commercial banks

Over the last decade, and especially since 2008, commercial banks have declined in their relative importance for infrastructure project finance:

“European lenders, which used to dominate infrastructure financing, are now busy repairing their dented balance sheets. Meanwhile, the new Basel 3 rules are steering banks away from the long term loans (often stretching beyond 20 years) required by backers of infrastructure projects.³⁹Banks are not only wary of making long term loans, they are also reluctant to take as much risk as before”

Institutional investors

Institutional investors, including pension funds and insurance companies, hold huge amounts of money and are interested in infrastructure assets with a yield profile matching their liabilities. However, their outlets need to have the required balance of risk and reward, which has limited their exposure in water. Two recent commentaries illustrate the potential for this investment:

“..institutional investors look set to capitalise on what Standard & Poor's sees as an unprecedented opportunity to invest in infrastructure around the world. A steady flow of projects and a better grasp of the risks associated with infrastructure lending are helping to draw pension funds, insurers, and other non-traditional financiers to investments that boast higher yields, as well as comparatively low default rates and better recoveries, than those similarly rated corporate debt, while also offering the asset-liability management that these investors need.all signs point to investors' increased

37 Delmon (2015) is a good succinct analysis.

38 *Financial Times*, 12 Jan, 2014, p. 9

39 With the following qualification “The one exception is Japanese banks, which have stronger balance sheets and are keen to put money to work” loc. cit. (*The Economist*, March 22, 2014, p. 73)

40 (Standard & Poor's *RatingsDirect*, “Global infrastructure: how to fill a \$500 billion hole”, Jan 16, 2014, p. 13).

allocations potentially filling a significant portion of the hole that governments leave...⁴⁰

“Long term investors such as insurers and pension funds are eager to plough money into infrastructure, as are endowments and sovereign wealth funds.”⁴¹

Sovereign Wealth Funds (SWFs)

SWFs (defined as “a state-controlled entity that invests national wealth for the benefit of future generations”⁴²) are growing in size and number and diversifying the asset classes for their investment holdings. Infrastructure features increasingly in their plans, but, like other institutional investors, SWFs seek safe and profitable havens for their citizens’ money. They have a long term perspective – the Norwegian Government Pension⁴³ Fund, handling \$857 billion of assets, claims to operate on a 100-year view.

“We are long-term investors. We are very, very patient...”(Anthony Lim, Government of Singapore Investment Corporation.⁴⁴

There are 78 SWFs on the list kept by the Sovereign Wealth Funds Index. SWFs’ assets under management totalled \$7 trillion in 2013, plus a similar amount held in other sovereign wealth vehicles such as pension reserve funds, development funds and funds of state-owned corporations. 11 SWFs each have assets exceeding \$100 billion.

Compared with ordinary pension funds, some SWFs accept lower target financial returns from their potential investments if there are offsetting benefits of other kinds⁴⁵.

Bonds

Bonds are a traditional means of raising funds for public infrastructure, with a long history in developed countries, particularly at municipal level. US cities have been the largest global issuers, helped by the tax-exempt status of these bonds, and by the use of state revolving funds to “pump prime” the process. A number of African countries have made their debut on

the sovereign bond markets. Glas Cymru, the water service provider in Wales, is wholly financed from bonds.

In 2009 a total of \$10.8 billion was raised from 24 bond issues by water utilities and government water infrastructure funding bodies. This was mostly for corporate (private sector) debt (Lloyd Owen, 2009, p. 75).

Project bonds

Project bonds are another security class with promise⁴⁶

“The success of the Shuweilat 2 project bond could open up a new funding avenue for regional power and water projects in a market that has been held back by a lack of long-end liquidity and rising loan costs” (Global Water Intelligence August 2013, p. 27. [This is an independent power and water project in Abu Dhabi which issued an \$825 million bond refinancing in July 2013].

Also notable is the Ethiopian Great Millennium Dam Bond, a “popular” bond for subscription by Ethiopian nationals, enjoying a government guarantee, whose proceeds are earmarked for building the dam of the same name. The bonds carry interest rates linked to, and greater than, LIBOR, and interest is free from tax..

Green Bonds

Green Bonds are intended to raise finance for projects that help the transition to low-carbon and climate-resilient development. The global market for Green Bonds has grown rapidly from a very low base to \$10 billion in 2013 and \$33 billion in 2014.⁴⁷ Initially IFIs (World Bank, AfDB, EIB) were the largest issuers, but now corporate issuers (e.g. Unilever, GDF Suez, Toyota) are of similar importance. The World Bank’s Green Bond is the market leader and its standards of eligibility and governance set the tone in the market: water and wastewater projects make up 49% of its adaptation, though only 3% of its mitigation, portfolios. Green Bonds are typically of investment grade, hence can attract institutional investors.

41 The Economist”, March 22, 2014, p. 73)

42 Gillian Tett, FT 5 Dec 2014, p. 13

43 Strictly, not a conventional pension fund since its income is from the petroleum industry.

44 FT 20 May 2014, p. 8

45 Tett, loc. cit.

46 not to be confused with the EIB’s Project Bond which, depending on context, can either be a means of credit enhancement for other investors in a project, a source of money in its own right, or both

47 The Economist July 5, 2014 and Financial Times 30 Jan 2015, p. 30.

In June 2014 the Netherlands Water Bank (*NWB Bank*) launched a 5-year EUR 500 million Green Bond to support the Bank's lending to Dutch water authorities.

International Financing Institutions (IFIs)

IFIs have a minor share of the water infrastructure finance market in the middle and low income countries in which they operate. But they have a crucial role nevertheless, due to the favourable terms of their loans, their ability to deploy a range of products including advice and technical assistance, and the "halo" effect they bring to other market players. IFIs do, however, operate in an increasingly competitive financial market, requiring them to offer innovative products tailored to gaps in the market.

"There is already spare capacity on the [World Bank's] balance sheet, which middle income countries have been reluctant to use, because it is easier to finance their infrastructure needs in private capital markets."
(FT, April 8, 2014, p.9).

In FY2014, the World Bank lent \$4.332 bn for Water, Sanitation and Flood Protection. Some of its lending for other categories, such as Energy, and Environment and Natural Resources Management was also for water, in the wider sense used in this report⁴⁸. The Asian Development Bank is projecting lending of \$14 billion for water-related infrastructure, governance and capacity building from 2013-2020, equivalent to \$2 billion annually.⁴⁹ In 2013 the African Development Bank/Fund approved c. \$200 million for water and sanitation, plus hydropower and irrigation loans under other categories.⁵⁰ In Latin America the IDB approved \$775 million of loans in 2013 for water and sanitation, excluding water-related lending in other categories⁵¹, and the Andean Development Corporation (CAF) in 2014 approved loans of \$900 million for water.⁵²

Some important new infrastructure banks and facilities are appearing. A new BRICS Bank is being formed, and Asian countries will also be served by the new Asian Infrastructure Investment Bank (Box 6).

Box 6. Asian Infrastructure Investment Bank (AIIB)

The initiative to form the AIIB was announced by the Chinese President in October 2013. It is aimed at Asian countries, though non-regional members are also welcome. By September 2014 over 20 had expressed interest in joining the Bank, the location of which is still to be decided. The process of signing a Memorandum of Understanding, Articles of Agreement, and ratification is scheduled with the aim of allowing a start of operations by the end of 2015. The Bank's capital will be US\$100 billion, with national subscriptions varying according to size and level of development. 70-75% of lending will be to Asian member states.

The Bank's focus will be on infrastructure, unlike the wider remit of the World Bank and Asian

Development Bank, whose mandates include poverty reduction. "Infrastructure" will be defined broadly to include energy, transport, urban development, rural infrastructure, logistics, transport, oil and gas pipelines, irrigation, water supply, wastewater treatment, etc. The AIIB will, in principle, support major dams, but will operate judiciously, observing international best practice towards environmental and resettlement issues.

AIIB is likely to be a bigger lender than the BRICS Bank in Asia, and its presence will be felt in other regions too. The Bank's aim is to work cooperatively alongside existing IFIs and seek to observe international best practice towards lending principles, practice and conditionality.

Source: presentation at HLP Workshop in Beijing, Sept 24, 2014

48 World Bank, *Annual Report, 2014*

49 Speech by Vice-President Venkatachalam to Budapest Water Summit, 11 Oct, 2013

50 African Development Bank *Annual Report 2013*

51 IDB *Annual Report, 2013*

52 Memo by CAF for the HLP

EIB is piloting a new “mezzanine” project bond instrument, which can either be in the form of a loan or contingent facility, in support of “senior” project bonds. The aim of the Project Bond will be to enhance the credit rating of the senior bonds, thus widening access to sources of finance and minimising overall funding costs (EIB, 2012)

The EU-Africa Infrastructure Trust Fund is a “platform” on which grant finance can be blended with loans to produce the optimal project finance package in each case. At the end of 2012 25 projects to a value of Euro 3.8 billion supported by 40 grants totalling Euro 378 million were in progress. The new Africa50 fund will also combine finance of different types for water projects (see Chapter 6).

Microfinance

The term “microfinance” can refer to any source of small-scale lending to households, farmers, or small private water operators. There is a wide variety of institutions active in this sector, drawing their funding from public deposits, from a larger parent organisation (e.g. a conventional bank), from donor agencies, NGOs, or a combination of these. Reliable estimates of the size of this financing sector relative to water are difficult to obtain (Tremolet, 2012).

Climate finance

The numerous climate funds, especially the existing Adaptation Fund and the Green Climate Fund now being formed, will become potentially important in funding the creation of new, and the adaptation of existing, water facilities to make them more climate-resilient (Nakhouda & Norman, 2014).

The current stock of water infrastructure will need to be adapted to make it resilient to likely future climate change, including more extreme fluctuations. The next generation of infrastructure is likely to be more energy-efficient and climate-friendly than the current stock. For both reasons, water infrastructure will be able to tap into the various kinds of climate finance which are becoming available⁵³.

In December 2014 the meeting of the Conference of the Parties (COP) in Lima ended with a further pledge of contributions to the Green Climate Fund, bringing the total so far to \$10.2 billion. Further pledges were also made to the existing Adaptation Fund.

Export credits (inc. loans from China & other emerging markets)

Export credits are a standard part of most major infrastructure projects, offering short and medium term finance for off-shore equipment and services.

Loan finance from China and other emerging economies, typically on terms intermediate between concessional and market rates, is now a major element in the funding of water infrastructure. The China Development Bank is now the world’s largest funder of dams, both in China and overseas. The China Export-Import Bank is another major lender in this sector. Altogether, it is estimated that China is currently financing 300 dams worldwide⁵⁴

The majority of African countries are engaging with China on infrastructure finance deals (mainly through the China Export-Import Bank), which are offered on intermediate terms between fully concessional and fully commercial rates. A number of deals are financed under the *Angola Mode*, whereby repayment is effectively made via exports of natural resources. Hydropower projects are common targets, and a number of the large dams being built, or recently completed, in Africa have received funding from China. (Foster *et.al.* 2008).

III. EQUITY INVESTORS

Certain sources of equity finance have already been discussed (institutional investors, Sovereign Wealth Funds, IFIs, etc). Others are presented below.⁵⁵

Specialised water funds

Several funds (Pictet, Blackstone, *et. al.*) have funds specialising in securities pertaining to water. The oldest and largest of these is Pictet, with a current

53 Comprehensively tracked in www.climatefundsupdate.org

54 Presentation by Benedito Braga at the Stockholm World Water Week, Sept, 2014

portfolio size of Euro 2.828 billion.⁵⁶ Their investors are typically individuals of high net worth, and the funds are held in listed securities (equities or bonds).

Private equity funds

Private equity firms invest in water and Table 3, compiled by Global Water Intelligence, illustrates recent large deals. Such investments are skewed towards specific asset classes: GWI notes that they are exclusively located in OECD countries and they have not exposed investors to single-asset risks. In several of the earlier cases in this Table, the private equity firm has already exited from the investment.

Private equity funds typically buy ownership (equity) in companies with good prospects of profit. In the privatised water industry of England and Wales, out of 27 transactions involving mergers, acquisitions and buy-outs since 2000, 20 have involved private equity funds⁵⁷. Globally, only a minority of water service providers meet these criteria. However, such funds can increase the flow of new money into water indirectly, in two ways. Firstly, they offer a secondary market for infrastructure finance, enabling original investors or lenders to exit, thus reducing the latter's liquidity risk. Secondly, utilities with suitable market status can sell stock to private equity funds and release

Table 3: Selected large private equity investments in water

private equity firm	investment	Year of investment	Value of deal (US\$)
Clayton, Dubilier & Rice	Ashland Water	2014	1.8 bn.
Kohlberg Kravis Roberts	South Staffs Water	2013	Undisclosed
Kohlberg Kravis Roberts	Bayonne concession	2012	150 mn.
Carlyle	Park Water	2011	102 mn.
Kohlberg Kravis Roberts	United Envirotech	2011 & 2013	153.8 mn.
JPM Asset Management	SouthWest Water	2010	427 mn.
American Securities LLC	ADS	2010	undisclosed
Metalmark Capital	Ni America	2007	100 mn.
Bain/Carlyle/CDR	HD Supply	2007	10.3 bn.
Apollo Global Management	Rexnord	2006	1.825 bn.
Blackstone/Apollo/GS	Nalco	2003	4.13 bn.

55 This section does not deal explicitly with "direct" investment by transnational corporations. This is normally defined as the acquisition of an equity stake in a venture sufficient to give a controlling interest, usually 10% or more. In water, this typically happens through equity in a Special Purpose Company or Vehicle

56 Pictet website

capital tied up in water infrastructures in order to generate funds for spending on new projects.

As noted by GWI, “the emergence of a relatively liquid market for equity stakes in brownfield water infrastructure projects means that investors who are prepared to assume early risk – including construction risk – increasingly find that there is a natural exit opportunity once a project enters the operational phase.”⁵⁸ This is particularly the case in a context where the equity market is highly volatile and bond markets only ensure low yields: some water projects generate the stable revenues and limited risks that long term investors seek.

The typical deals featuring in Table 3 involving private equity firms are for desalination, wastewater treatment and reuse projects, for either municipal or industrial clients.

Venture capital

Venture capital (VC) refers to equity invested in start-up or small on-going companies. The expectation of the venture capital investor is that much of the investment will be lost, but profits would be recouped on the small proportion of successful schemes. VC is likely to become increasingly important in financing technological innovation in the water industry.

The high risk associated with newer technologies may reduce financing options for innovative water management (OECD, 2013). The risk profiles of projects vary according to their technology and its stage of development, which determines the type of financing which is most appropriate. Venture capital is generally suited for unproven and untested technologies, while project finance is used for mature technologies. In one case, water and wastewater accounted for 3% of Cleantech Group’s venture capital fund- raising in 2007-12.⁵⁹

Public-Private Partnerships (PPPs)

PPPs are still on the rise globally, but their roles are changing. Many new businesses from emerging countries have entered this market. A recent survey

(Perard, 2012) records a doubling of the number of PPPs in water infrastructure in 2001-2010 compared with 1991-2000 (523 compared to 232). However, the total value of the PPP projects in the latter decade (\$29 billion) was less than that in the former (\$58 billion). After peaking in 2008, activity fell for several years, but is now recovering.

In a global perspective, PPP has made greatest progress in “Greenfield” projects such as water and wastewater treatment, desalination, and services to industry, using contracts of a BOT or similar form. In many countries there is still resistance to the direct interface of private water supply companies with household water users, whereas there is no such difficulty with industrial or wastewater services. This explains the significance of several projects in smaller Indian cities, where hitherto there has been strong political resistance to private involvement in water supply services. In the cases in question, the new mindset is that “..public funding is making PPP projects possible” (Kacker *et. al.* 2014).

57 David Lloyd Owen, private communication

58 Quoted in OECD (2015) p. 52

59 Correspondence from David Lloyd Owen

SUMMARY OF TRENDS, OUTLOOK AND POTENTIAL OF SOURCES OF WATER FINANCE

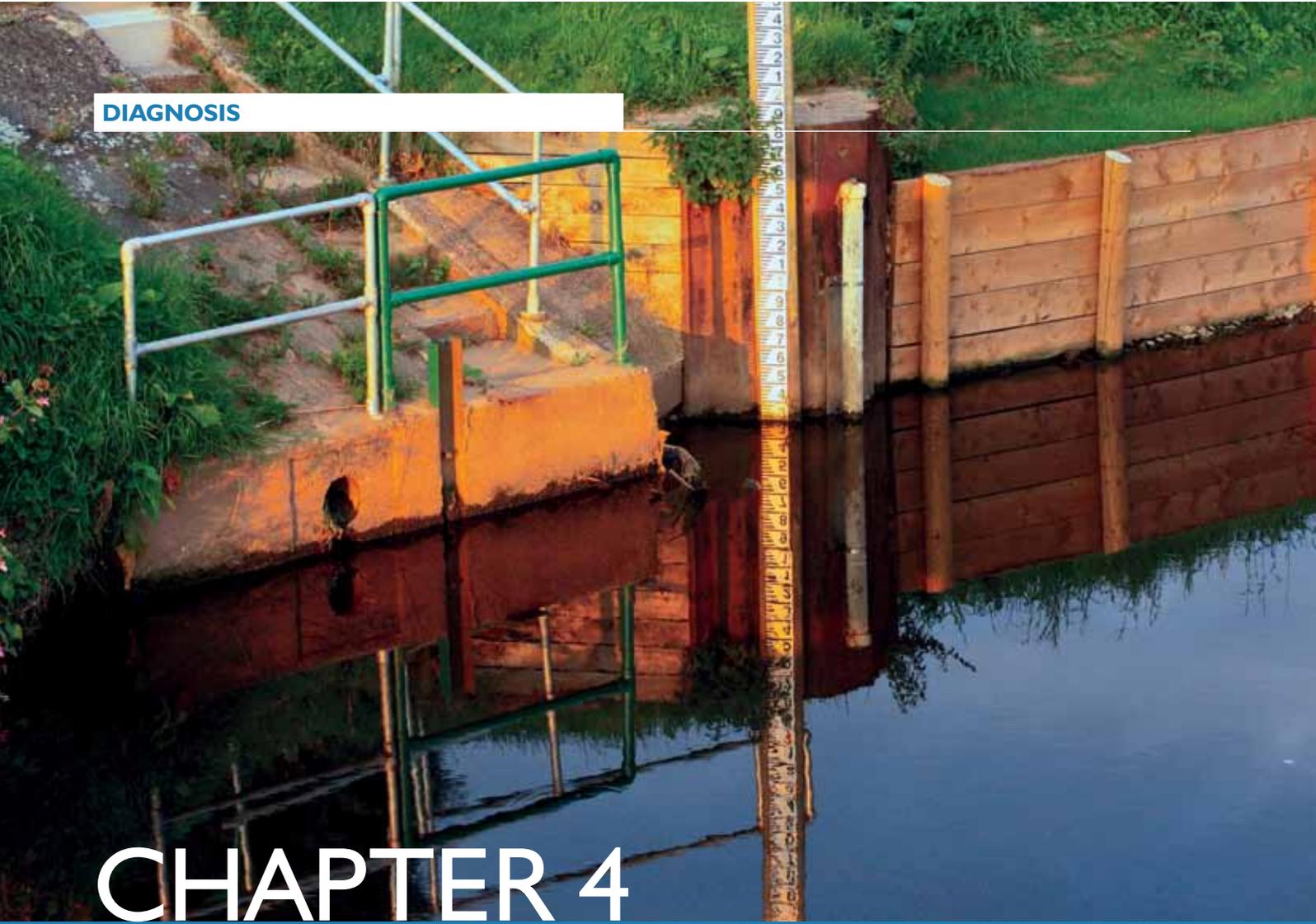
Table 4 provides a broad summary of the global supply of water finance.

Table 4: trends, outlook & potential of water financing sources

Financing source	Trend since 2000	Future outlook	Potential scale & determining factors
3Ts.(1) Tariffs	No clear trend. Weak cost recovery in most water supply & surface irrigation systems, in the face of rising costs.	Continuing resistance to tariff reform will remain a drag on proper funding of O&M	Will remain major source of finance for O&M, which is set to rise in all regions. Great scope for increasing efficiency, including metering & revenue collection. Need to create “virtuous circle” of good service & higher revenue collection
3Ts (2) Taxes	Some countries have stronger public finances due to growth & better macroeconomic management: others struggle with unresolved budgetary problems.	Many economies face general fiscal constraints; fiscal burden of continuing water & irrigation subsidies increasingly felt	In many countries subsidies will remain in order to promote “affordability”, also due to social & political resistance to reforms. Pressure to make subsidies “smart” & targeted. Urban property taxes becoming major source
3Ts (3) Transfers from ODA & philanthropic sources	DAC donors more selective; overall ODA for water now rising after period of stagnation; much more private philanthropy & corporate initiatives (e.g. Corporate Social Responsibility)	Modest increases likely to continue for selective poorer countries, esp. In Africa. ODA marginal or absent for most countries. Private & corporate initiatives will multiply	ODA will be important to delivery of SDGs. But for all but a few dozen countries, ODA will become marginal. Private (e.g, Gates, other NGOs) and corporate philanthropy is rivalling ODA in size, and more innovative. ODA increasingly using novel delivery forms, e.g. OBA, RBA ⁶⁰ .
Public development banks	Huge increase, esp. In middle income & emerging economies	Will continue to grow, subject to overall public indebtedness	Will remain main source of funds for major MPI , though increasing concern for “quality” of these loans

Financing source	Trend since 2000	Future outlook	Potential scale & determining factors
Commercial (public & private) banks	Marked decline in their share of infrastructure project finance due to Basel III rules & 2007-8 crisis.	Slow recovery in prospect, but water will struggle to attract its share of more selective lending. Exception is Japanese banks, still expanding.	Limited by the supply of “bankable” propositions, & will need “comforts” of various kinds (e.g. guarantees)
Municipal bonds	USA largest user, declined after reduction of “monoline” insurance” after 2007-8	Growth likely, especially in OECD and some other creditworthy countries.	Well established in USA, EU, India, China, Brazil & some other emerging countries with large & creditworthy cities. Often relies on guarantees from central government.
Project bonds	Outside the USA & W. Europe, rare, except in Middle East & Malaysia. Severe decline in 2008, now recovered former levels.	Promising, esp. for power & water projects in Middle East.	Important for specific regions with bankable Greenfield projects (Middle East, Malaysia, some African) for selected types of project (e.g. desalination or wastewater)
Institutional investors & Sovereign Wealth Funds	Major growth	Rapid growth	Almost infinite supply of funds for securities (bonds, equities) offering desired balance of risk and reward. Often “patient” investors.
Private equity funds	growth	Continued growth	Mainly for OECD countries; few projects offer required profitability & risk profile. But provide liquidity (exits) to infrastructure finance market
Venture capital	unclear	Growth expected	Minor overall, but vital in supporting unproven technology
International Financing Institutions (IFIs)	Continuing growth & revival of lending, inc. for major water projects	Continuing growth	Crucial element in MPI projects, esp. for residual risk & “halo effect”. Developing new products for co-funding & risk-sharing. Normally incurs forex risk

Financing source	Trend since 2000	Future outlook	Potential scale & determining factors
Export credit	Rapid growth, esp. from Chinese and Japanese sources	Continuing growth	A key source for all projects; short/medium term funding, with forex risk.
Climate funds	Rapid growth from a small base	Continuing growth, esp. when Green Climate Fund comes on stream. IFIs also lending more	Currently minor, but will grow in importance for both mitigation & adaptation. Fragmented market.
PPPs	Growth badly dented by 2007-8 crisis, some recovery occurring. Underlying trend of withdrawal by major N.American & European companies. Growth of new companies from emerging markets.	Major growth, esp. from expansion of “new” players in their own markets and abroad.	Growing demand for expertise of private operators; their direct financial contribution unlikely to be large, but indirect impact critical.
Property developers	With growing urbanisation, big increase from inclusion of water systems in comprehensive development schemes	Rapid expansion will continue. Increasing recourse by authorities to developers to fund flood protection, drainage, storm water management, etc.	Becoming a major source of finance for urban water infrastructure in all regions.



DIAGNOSIS

CHAPTER 4

MANAGING RISKS IN WATER FINANCE

MAIN POINTS MADE IN THIS CHAPTER

- ▶ The risk-reward calculation for water is crucial to securing financing of the right type, in the right volume. Proposals are made in Chapter 6 for addressing the “reward” side. The current chapter focuses on risk, widely perceived as a crucial obstacle to greater water financing.
- ▶ Water financing involves the usual range of project risks plus some specific to— or disproportionate in— the sector.
- ▶ Risks have to be shared amongst the financing parties according to the risk appetite of the different parties, their willingness and ability to bear the risks, and their options to mitigate risks.
- ▶ Some risks can be mitigated in various ways by using guarantees and other devices
- ▶ The test of successfully allocating and mitigating risk is minimising the Weighted Average Cost of Capital of the project concerned.
- ▶ Some risk and uncertainty may remain after all these processes. These risks have to be borne by equity holders. Depending on the type of assets, these could be either public or private, plus IFIs, donor agencies and other kinds of “patient” investor.
- ▶ In projects of strategic or other public importance, public authorities are likely to have a major presence as providers of equity, long term loans and guarantees of various kinds.
- ▶ Large multi-purpose water projects carry additional layers of risk and the problem is compounded when these are also of a *transboundary* nature.

WHAT IS “RISK”?

In this Report, risk arises in several different contexts:

- i) **Society’s risks** from water. In the Introduction these were characterised as risks from water scarcity, flooding, pollution, the impact on health and poverty of a lack of water and sanitation for households, and threats to the integrity and resilience of crucial aquatic ecosystems. Water security is the state in which these risks are adequately managed.
- ii) In the context of disaster prevention, **residual risk** is what remains to be borne by individual citizens (households, farmers, businesses, etc) after all feasible actions have been taken by governments to manage and mitigate the societal risks stated above. Some of these residual risks may be privately insurable, others not.
- iii) **Hydrological risks** are those affecting specific businesses, farmers, public utilities and other productive enterprises due to variations in the quantity, quality or other characteristics of water. This may be water used as inputs to their operations or their exposure to water risks of other types (e.g. flooding or drought affecting their operating environment). Operations that are major users or polluters of water can also be the source of hydrological risk to others.
- iv) **Financial risks** are those arising for lenders, investors, sponsors, bond holders and all others exposed to water projects, business models, service providers etc. These are the risks of them losing their money through their involvement in water infrastructure and services, rather than some other area of activity.

This Chapter focuses on the last of these risk categories, namely, the financial risk entailed by water financing. It deals with the risk-reward calculation, risk sharing, risk mitigation and the role of equity in financing remaining risk.⁶¹ A concluding section views the particular risks arising in multi-purpose infrastructure.

THE RISKS⁶² AND REWARDS OF WATER FINANCE

Investing in water infrastructure, and managing and operating these facilities entails considerable risk to all stakeholders concerned – governments, public agencies, public and private water operators, equity investors, commercial lenders, bond holders and other kinds of financiers, and others. Addressing risk is at the heart of the water financing conundrum.

But investment in oil, gas and mineral exploration and development is arguably much more risky, yet there is no obvious shortage of finance for these ventures, requiring huge sums of money committed in regions with political instability and questionable governance. This is because of the large potential returns (“up-side”) in these sectors, compared with water. The problem for many water financing propositions is that the very real “downside” risks they entail are not compensated by the prospect of sufficient financial “upside” returns. In short, water’s risk-return calculus does not have enough appeal to investors and financiers, compared with alternative outlets for their money.

The risk-return issue differs according to the type of finance (equity, loan, bond, microfinance, users’ own savings, etc.) and for different categories of water assets (urban water distribution, household sanitation facilities, desalination plants, sewerage, wastewater treatment, irrigation, bulk water supply, multipurpose strategic storage, etc.). Hence the discussion of this issue can only proceed so far at a general level, and it is important to be aware of the variety of circumstances that arise.

Hydrological risks

Hydrological risk is inherent in all activities dependent on water. A shortage of water, which may be seasonal, multi-annual or secular, is a threat to a wide range of economic activities – municipal water supply and water-based sewerage, water-intensive⁶³ industries and agriculture, hospitals, mines, power stations, shale-gas production, hotels, etc. At the time of writing, Sao Paulo state, the economic powerhouse of Brazil, is enduring a

61 This is sometimes called “residual risk” but to avoid confusion with the other sense of residual risk, the term “remaining risk” is used here.

62 In statistical terms, a “risk” is often defined as a “quantified uncertainty”, i.e. the statistical probability of a defined event happening. In this Report risk is used in the more popular sense of the likelihood of a bad outcome for an investment in a project, business venture, or financial security (equity, bond, loan).

63 Including industries where the *quality* of water is of the utmost importance, such as food, beverages and some high-tech companies.

water crisis in which its *Cantareira* reservoir system, on which 6.3 million people depend, has fallen to 7% of its capacity.⁶⁴ Businesses are also exposed to flood risk and coastal inundations; the 2012 Thailand floods severely disrupted many international producer supply chains.

Water-dependent companies may also incur the less tangible reputational risk from being perceived (by their shareholders, campaigners, consumers, governments, etc) to aggravate water stress in various ways through their presence and operations.

Water projects are themselves subject to hydrological risk. New distribution networks may depend on water supply sources that turn out to be unreliable. Irrigation systems may rely on intakes that run dry in some years. Reservoirs may never fill to their capacity due to assumptions about average inflows which prove to be wrong. Water and wastewater treatment plants may be rendered inoperable by flooding, which could also overwhelm sewage networks, causing overflows.

Financial risks

Some financial risks are generic to all projects or all types of infrastructure (Yescombe 2014). *Commercial risks* are those inherent in the project itself or the market in which it operates (also known as “project risks”), which affect revenues. Water is plagued by its poor record of cost recovery in the key sub-sectors of household water supply, wastewater collection and treatment, irrigation and hydropower generation. Water infrastructure is also exposed to *construction risks*, including site-specific problems. The construction of dams and creation of reservoirs, and excavation work entails by tunnels, canals and underground pipelines make geological and seismic risk a major concern. Delays and cost overruns are particularly high in these activities.

Technology risks arise from machinery, equipment and installations failing, or not performing in the local conditions. Although much technology used in water is tried and tested, these technologies may not perform in specific local conditions. Desalination and wastewater treatment plants are particularly prone to operating problems, causing their underutilisation. *Revenue risks* – including offtaker risks – are important because water

infrastructure typically involves a heavy sunk cost, which once incurred, leaves the investor at the mercy of the local market and its regulators, with limited redress.

The supply of key *inputs* is another source of risk. Energy, of which water is a heavy consumer is a case in point. Many water projects, particular larger ones, run into trouble because of *environmental* risks. Major works with an impact on surrounding areas risk being seriously delayed pending reviews and consultation, with attendant costs. This is particularly likely for dams and conveyance systems.

Macroeconomic risks comprise external economic effects not related to the project directly, but having a serious potential impact on its financial viability. They include growth in GDP and the Government’s policy response, inflation, interest and foreign exchange rates.

Political and regulatory risks arise from changes in Government actions, political events such as war and civil disturbance, actions by terrorists or separatists, disruptive behaviour by labour unions, NGOs, or other activists.

Particularly important in this context is the behaviour of the national regulatory authority responsible for monitoring the performance of the project. Regulators may succumb to unpredictable and arbitrary decisions (often under political pressure) affecting the ability of sponsors to raise tariffs which would hinder their ability to fulfil other contractual obligations.

Although good independent regulators provide reassurance to investors and operators, they may add to the latter’s risks if they interpret their role narrowly or inappropriately. An example of this would be if regulators failed to take account of the impact of urban floodwater inundating and damaging sewerage networks and wastewater treatment plants.

64 *Economist* Dec 20, 2014, p. 67. “Only a deluge can save Sao Paulo” (Sr Vicente Abreu, Head of Brazil’s National Water Agency).

SHARING RISKS

The commonly accepted principle for sharing risks in a project's contractual and financial arrangements is that risks should be allocated to those parties best able to bear them, most efficiently, and at least social cost. Another useful working principle is that "the party that has the greatest control over a risk should bear primary responsibility for it".⁶⁵ In following these principles it needs to be recognised that parties to a contract have different *risk appetites* depending on the strength of their balance sheets – their *risk-adjusted* returns must cover their cost of capital.

In *EPC and Turnkey* contracts, the contractor is made responsible (i.e. bears the risks) for keeping within budget and delivering on schedule. An *EPC* is a contract to design & Engineer the project, Procure or manufacture plant or equipment & Construct the project or important parts of it. A large and complex project may include several *EPCs* covering important discrete components of it. A *Turnkey* contract covers the delivery of a complete project fully equipped and ready for operation. Such contracts are commonly fixed-price, and specifying a completion date ("date-certain").

EPC and *Turnkey* contracts usually include penalties for late delivery, and conversely may give financial incentives for early completion. However, such contracts usually exclude any reimbursement for exceeding budgets, except in narrowly defined circumstances. Thus the financial risk of cost increases or delays rests with the contractor. These contract types also leave *counterparty* risk to the principal contractor – these are all risks entailed in dealing with sub-contractors, such as construction, electrical systems, input supplies, etc.

In contracts for the management and operation of public assets, contractors usually face penalties for bad, and incentives for good, performance against defined performance indicators, thus absorbing a large part of operational risk. Demand risk can either be assumed by the private contractor (in a long-term concession) or passed to the public offtaker (in a take-or-pay arrangement under a BOT), depending on how far future demand is affected by events in the respective control of the two contractual parties.

Contractors do not enjoy the same level of control over other risks such as geological and seismic risk, environmental compliance, and social aspects of resettlement. Even after all necessary studies have been made, the start of construction of a major project may throw up geological or other surprises, coping with which may be time-consuming and costly. Environmental compliance and resettlement can also cause serious and unpredictable delays in the implementation of a major project. Managing these risks is likely to be costly for the private contractor, and would be reflected in higher bid prices to cover extra due diligence, legal costs, insurance, cost overruns due to delays, and more expensive financing costs.

It has been argued (Head, 2000 and 2004) that in the case of hydropower projects it could be more cost-effective for public sponsors to retain these risks on their own account rather than devolve them, inappropriately and expensively, to private contractors.

Figure 2 illustrates how risks could be allocated in structuring a project finance deal. Each *project finance structure* will have its own specific features, and actual arrangements for risk allocation may differ from those in this example).

A well-structured financing deal is one with an appropriate allocation of risk to the different parties to the contract, such that the project has the lowest possible Weighted Average Cost of Capital (WACC). The WACC takes account of both the average cost of debt (from various sources) and the cost of taking requirements for equity returns into account.⁶⁶

⁶⁵ Memorandum to the HLP from Suez Environnement

⁶⁶ Yescombe (2014) pp 341-343

Figure 2. Illustration of Allocation of risks in project finance



Source: memorandum for HLP from Suez Environnement

MITIGATING RISKS

Once risks have been shared to the different parties to a contract or financial investment there are opportunities to *mitigate* these risks in various ways. This section discusses financial guarantees and other methods.

Financial Guarantees

Guarantees offer insurance against specific risks, such as default on credit or bond repayment, regulatory difficulties and political risks (war, civil disturbance, nationalisation, restrictions on foreign exchange availability, etc.). Bond insurance is available from private companies (*monolines*) at commercial rates, though this source has been greatly reduced in the aftermath of the 2007 global financial crisis, which saw some leading monoline insurers going out of business.

In a development finance context, the more relevant guarantee products are those offered by International Finance Institutions such as the World Bank (including MIGA and IFC), regional development banks such as the AfDB, AsDB, laDB, the European Investment Bank, and certain bilateral development agencies (e.g. the French AFD).

Insurance and guarantees are available to cover political, contractual, regulatory and credit risk⁶⁷ from both multilateral and bilateral development agencies. These guarantees have a *development* motive, as opposed to export credit and investment insurance, limited to firms domiciled in the country offering the guarantee, which has a *commercial* aim. There is also a large and active private market offering insurance against political, contractual and credit risks. Although the discussion in this section is mainly concerned with external guarantees, in many cases *sovereign* guarantees offered by national governments to their own sub-sovereign bodies or to investors in their territories may be equally, or more, relevant.

Certain other instruments have a *quasi-guarantee* status, such as the “umbrellas of comfort” which IFIs and other agencies erect over other lenders and investors through participations (“B loans”) and Municipal Support Agreements⁶⁸.

One important aim of guarantee programmes of IFIs and bilateral donors is the promotion of local capital markets as safe outlets for local savings and sources of longer-term capital for local businesses, microenterprises and other purposes. It is no coincidence that most PPP projects

⁶⁷ Insurance against exchange rate risk is currently not a practical proposition.

⁶⁸ A formal agreement between the lender (e.g. an IFI) and the host municipality that the latter will ensure by all means within its power that subsidiary public service agencies such as water utilities will continue to honour the terms of their loan from the IFI.

have been in countries with strong local capital markets, which enable borrowers to avoid forex risk.

Guarantees cover four main categories of risk incurred by lenders and equity investors in developing countries:

Political (war, civil disturbance, terrorism, kidnappings, nationalisation, expropriation without adequate compensation, restrictions on the conversion and transfer of foreign exchange needed for the project). Insurance cover is available from the Multilateral Investment Guarantee Agency (MIGA) of the World Bank, other IFIs (through B loans⁶⁹), bilateral official agencies and private insurers. This is a large, well-established and active market, with supply well matched to demand.

Regulatory and contractual (breach of contract by public offtaker⁷⁰, adverse decisions by regulators or other public agencies due to political pressure). Cover is available from MIGA Breach of Contract and Non-Honouring of Sovereign Obligations policies and the World Bank's *Partial Risk Guarantee*. The product is case-specific, complicated to draw up and recovery can be protracted.

Credit (late payment or default on loans made, or goods and services provided, for commercial reasons). *Partial Credit Guarantees*⁷¹ (PCG) are offered by IFC and other IFIs; some bilateral donors have *Partial Loan Guarantees*⁷², and insurance policies are also sold by private *monoline* companies (specializing in providing financial guarantees).

Foreign exchange (devaluation which increases the local currency cost of debt servicing, dividend remittances and other commitments in foreign exchange). This is not widely insurable from either private or official agencies. A more realistic alternative is the use of local finance, assisted where available by local currency guarantees to enhance the status and

rating of local borrowers and bond issuers (e.g. IFC local currency PCG, and the Guarantco⁷³).

Guarantees work by:

- ▶ Mitigating specific risks that are the critical sticking points on a project.
- ▶ Enhancing securities (e.g. bonds) to take them over a critical threshold of creditworthiness ("investment grade").
- ▶ Improving the terms on which borrowers and project sponsors can get access to loans and investment.
- ▶ Giving lenders and investors exposure to previously unfamiliar markets and products.

Other mechanisms for mitigating financial risks

The abovementioned do not exhaust the menu of possibilities open to sponsors and potential financiers of water projects. Other methods include:

- ▶ Insurance taken out against specific risks (e.g. *weather risk insurance* available for farmers in some countries).
- ▶ *Currency hedging*⁷⁴ is possible (at a cost) against forex risk.
- ▶ *escrow accounts* created to ring-fence the project's revenues to give priority to the payment of debt service or dividends.
- ▶ Using financial products with terms that change according to the performance of the underlying asset or project, e.g. loans that can convert into equity, loans that are *index-linked* to the output or prices of the venture, or Islamic *sukuk* bonds that pay according to the profit made by the underlying asset.

69 Syndicated loans organised by the IFIs, and offered for *participation* by commercial banks and other institutions, and guaranteeing the latter the same *preferred creditor status* as the IFI.

70 The public sector sponsor or client for which the project is implemented, and which purchases the output of the project (e.g. water or wastewater treatment). These purchases may be guaranteed through a *take or pay deal* which indemnifies the operator in case demand is less than expected.

71 Defined as a guarantee for only part of the credit involved.

72 As for footnote 71.

73 A new scheme promoted by the UK DFID and other agencies targeted at low-income countries and offering guarantees and counter-guarantees to institutions and companies raising local currency finance

74 Taking up an opposite position in the currency markets that would neutralise the impact of a foreign currency movement on a project.

- ▶ issuing *junior (or subordinated)* debt to enhance the creditworthiness of senior debtors. The Project Bond being piloted by the European Investment Bank offers the option of either a loan or a contingent facility to support senior project bonds issued by a project company for infrastructure development (EIB 2012).

Allocating and mitigating risk for financing of water utilities in Peru

The issues raised in this section can be exemplified by a recent report on the scope for local financing of water utilities in Peru (Requena & French, 2009). The main purpose of this report was to consider how local water utilities could raise more finance while avoiding the foreign exchange (devaluation) risk that would arise from the use of debt denominated in foreign exchange.

In several important respects, the Peruvian situation was favourable to greater local financing, including a sound legal and institutional framework, sizeable local

banks, and local pension funds with ample resources and a track record of investing in national infrastructure projects. However, the main risks for potential financiers were those posed by the poor creditworthiness of most utilities. The proposed solutions revolved around a mixture of financial engineering (securitisation of future cash flows) and either sovereign or external financial guarantees to underpin bond issues.

The allocation and management of risks is illustrated in two specific projects, the first for a drinking water treatment plant, the second for an inter-basin water transfer project (Box 7).

In the cases in Box 7 CAA took the full construction risk, while CTO laid off construction risk to a sub-contractor through a Turnkey project. To cover the perceived different credit risks of the two projects, financiers demanded a 25% equity contribution from CAA, and priority to bondholders in the allocation of revenues, compared with the 8% equity portion for CTO.

Box 7. Risk allocation & mitigation in water concession contracts in Peru

The **Concesion Agua Azul (CAA)** is a Special Purpose Company formed in 2000 to take on a 27 year DBFO concession contract for a drinking water treatment plant near Lima, issued by SEDAPAL, the public company responsible for Lima's water services. On the strength of this contract, CAA issued local bonds for \$45 million to cover the infrastructure investments it was committed to, of which \$10 mn (later raised to \$18 mn) was taken up by local pension funds. CAA won the contract on the basis of lowest tariff charged to SEDAPAL.

Under this financing arrangement, CAA took the full risk of design, financing, construction, operating and maintenance, while the pension funds assumed credit (debt default) risk. CAA's contract is underpinned by a "take or pay" agreement with a sovereign guarantee, which effectively assures a certain cash flow. Additional credit enhancement was provided in the form of debt seniority, and the creation of an escrow account controlled by CAA's creditors.

The **Concesion Traslase Olmos (CTO)** is the Special Purpose Company created to handle the US \$242 million 20-year DBFO concession for a large inter-basin transfer project awarded in 2004 by the Regional Government of Lambayeque. The contract was awarded on the basis of the lowest capital subsidy required. The funding package comprised \$100 mn of corporate bonds, \$77 mn of loans from the Government of Peru, a loan of \$77 mn from CAF, and \$20 mn in equity. Pension funds took \$60 mn of the bonds in private offerings, and \$40 mn was taken up by local insurance companies.

CTO assumed all design, financing, construction, operation and maintenance risks, while the institutional investors and other creditors took the credit risks. CTO, in its turn, worked with a "take or pay" agreement with a sovereign guarantee. In addition to the sovereign guarantee for the project's cash flow, the other financiers had the comfort of CAF's Partial Credit Risk guarantee and the creation of an escrow account (trust fund) to handle debt repayments.

Source: Requena & French, 2009

THE ROLE OF EQUITY IN ABSORBING REMAINING RISK AND UNCERTAINTY.

Assembling project finance packages involves the attraction of finance from funders with different degrees of risk appetite, and varying needs and expectations. An appropriate allocation of risks is required, which could involve the use of available risk mitigation instruments and risk management strategies.

Even after everything possible has been done to share and mitigate risk along the abovementioned lines, some uncertainty will remain, and the outcomes for the investor and sponsor will be risky. Equity holders (shareholders) bear this remaining risk, and in return have first claim on the profit (*upside*) from the venture.

Each project and business model needs sufficient equity to absorb risk and provide a cushion to cope with fluctuations in cash flow. Too much equity in a capital structure is a cost (because equity returns are expected to be higher than interest rates), while too little increases risk. Credit ratings agencies apply their own yardsticks for what is an appropriate balance in each case and make their rating on this basis – which affects the credit standing of the venture in question. Regulators and banks also have yardsticks for the equity-debt ratios they require to be observed in their regulated operators and clients, respectively.

In the current global financial climate, *debt finance* is strongly favoured over *equity issues* due to a combination of exceptionally low interest rates and the tax advantages that many governments give to lenders and bond holders as opposed to equity investors. While it is beyond the scope of this Report to try and change these deep-seated biases in capital markets, it should be pointed out that their result is to discourage the necessary element of equity in financing structures, thereby making them more risky. National and international public financing institutions and private funds able to provide equity capital play an essential role in financing water infrastructure.

Equity can be provided either from public or private finance. For major projects of strategic value, or which provide *public goods* or other *externalities*, Governments, or their proxies such as public development banks, could be justified in providing equity to the project⁷⁵. External donor agencies may do likewise. Sources of institutional finance such as pension funds may also provide funds, subject to their fiduciary obligations, if they are satisfied about the long term returns they can expect from their investment.

A different situation arises where state funding on favourable terms is provided out of expediency or opportunism for a project, in order to complete a financing package assembled by private funders. A fine judgement has to be made in this situation between giving an unwarranted subsidy to private partners and providing the latter with a buffer of comfort to enable their participation in a financing deal.

A similar consideration would apply to the offer by a Government, public development bank or IFI of financial products having junior status in any repayment process, in order to induce other lenders to take more senior debt. Governments concerned about this potential problem could take steps to ensure that the public has some stake in the “upside” of a project.⁷⁶

Equity investment involves more than just finance:

“Equity investment in infrastructure is a difficult function to fulfil well: it requires a level of sophistication different than most equity investment. It is not just a question of funding, but rather the governance, the ability to make critical decisions in times of need, and to provide technical and commercial support, given the complexity of an infrastructure transaction...In many countries, the lack of equity investment is a major challenge for infrastructure programs, reducing competition and making projects expensive.” (Delmon, 2015, pp 40-41).

- ▶ Governments, IFIs, water funds, pension funds, SWFs and other “patient” investors have a crucial role in providing equity to underpin the creation of water infrastructure.

⁷⁵ In this context, the proposal for a Mexican Water Fund has, as one of its functions, to “assume risks that the market is unwilling to assume, in order to encourage private sector participation” (Campanaro & Rodriguez, 2014 p. 33).

⁷⁶ In the case of the junior debt, this would also be provided at a higher rate of interest, reflecting its greater risk.

THE RISKS OF MULTI-PURPOSE INFRASTRUCTURE (MPI)

Water infrastructure will often serve more than one purpose and supply services to more than one category of user. An urban water utility will typically supply households, industries, hotels, public institutions and other paying customers, and the same entity will normally remove wastewater and stormwater for treatment. The multi-purpose nature of these services may have financial complications – e.g. cost recovery for stormwater capture and treatment (a *public good*) is becoming an issue in many cities.

The multi-purpose issue arises especially in bulk water development and supply. Water from a dam and reservoir will often be supplied for municipal use, hydropower generation and irrigation, and stored water has a potential role in drought prevention, flood management, and the maintenance of river flows for dilution of sewage, navigation and protection of aquatic ecosystems. These projects entail a number of specific risks.

In the first place, major MPI projects have heavy **investment costs**. The Xiaolangdi project on the Yellow River in China had an investment cost originally estimated at RM35.2 billion (US\$5.6 billion at current values.). Xiaolangdi's objectives, in order of priority, are flood control, prevention of ice jams, sediment reduction, power generation, irrigation and water supply⁷⁷. In the USA projects such as the Tennessee Valley Authority, the Columbia River projects, and the Hoover Dam have been massive in scale and cost, with transformative impacts on their hinterlands and regions. The Mississippi Flood Control Program has been under way since 1928 and is still incomplete, though it has already produced sizeable benefits for this extensive region (Delli Priscoli & Stakhiv, 2015).

Major MPI projects for the capture and transmission of bulk water are especially prone to challenges from campaigners on environmental, social and resettlement grounds. These challenges can seriously delay implementation, and introduce a high level of uncertainty into construction schedules and project completion dates.

The high initial costs of MPI schemes, combined with long implementation periods and the realisation of benefits over a long timescale, all increase their risks for conventional market-oriented financiers. Large dams are also prone to construction and cost overruns (Ansar et al. 2014) though this is a common feature of many large infrastructure projects.

A second class of problems is that MPI **benefits** cannot be fully monetised and captured. Not all of the functions and services from MPI are revenue-earning. Some (comprising *public goods*) are not, while others are *externalities* conferring benefits (and costs) on other parties which are not captured in the balance sheet of the project creating them.

There is, moreover, scope for conflict between the different users or functions of MPI, especially in times of water scarcity. The seasonal patterns of water demand from hydropower, irrigation, navigation, aquatic ecology, flood control and other possible uses are difficult to reconcile with each other.

The precise incidence and size of the benefits of strategic infrastructure for the storage and conveyance of water cannot be accurately predicted. Hence revenue streams have a high degree of uncertainty and returns to investments arise over a long time period beyond the investment horizon of most financiers. The incidence of the natural events that MPI is built to cope with (prolonged drought, serious flooding, failure of key installations, pollution events in vital water courses, etc.) cannot be predicted. Protocols for the allocation of water in the event of crises may be overridden for national strategic reasons. The probability of climate change adds to these uncertainties.

Uncertainties about its future benefits and a lack of clarity about future water charges have bedevilled the *Transposicao* project in Brazil, creating infrastructure for diverting some of the water from the River Sao Francisco to other parts of the Brazilian North East as a drought mitigation measure. Since the inception of the project in 2007 it has been largely funded by federal and state budgets. This is a strategic project to insure against a recurrence of the serious droughts

77 From a presentation to the HLP from the Chinese Ministry of Water Resources, Beijing, September 24, 2014.

that have always plagued this region. In strict financial terms, it has little appeal to private finance, especially since arrangements to recover the cost of the water from potential users, including some large landowners in the region as well as coastal cities, are still uncertain (OECD, 2014, p. 215).

The potential benefits of large MPI projects accrue to various institutions (power distributors, municipalities, farmers, river basin agencies, pollution control boards, navigation companies and boats, etc. This **market fragmentation** aggravates demand risk.

Cross-subsidy between different components of MPI (e.g. between power, irrigation and households, and between these and non-revenue earning functions) is in practice widespread, and indeed is often a key element in the viability of MPI schemes. However, where it happens on a major scale it can cause serious economic distortions. Subsidised prices for certain services can

lead to excessive consumption of water for these uses. Conversely, industrial and other users paying “excessive” tariffs in order to cross-subsidise others can lead them to switch to other means of service, including self-supply. Cross subsidy penalises the productive components within MPI and can seriously affect their prospect of attracting suitable commercial finance. Ideally, transparent and reliable means of financing public goods and non-revenue MPI functions is desirable if such distortions are to be avoided.

Finally, many larger MPI projects are of a **transboundary** nature, which adds an extra layer of complication to financing, since it involves agreements between the different countries involved. There is a risk of some country partners becoming free riders in the collective endeavour. More generally, the hydrological and other risks of transboundary projects cannot be ring-fenced (and dealt with) within national boundaries. ■



CHAPTER 5

TAKING STOCK OF THE SITUATION: ASSESSMENT & CRITIQUE

MAIN POINTS MADE IN THIS CHAPTER

- ▶ There are many examples around the world of successful systems of water finance, including some with a high degree of coherence. There are also many specific financing mechanisms showing promise.
- ▶ In the context of financing, the most fundamental difference is between funding for revenue-earning water services, on the one hand, and financing non revenue-earning, including major multi-purpose and strategic water projects, on the other. The latter are much more problematic.
- ▶ At a general level, water financing faces problems on many fronts. Budgets are inadequate and despite this are often under-spent. Policies and governance systems are weak, and institutions not “fit for purpose”. There is a shortage of “bankable” projects and creditworthy water businesses and institutions, which explains why so little institutional finance is attracted into water. Raising adequate funding for recurrent (opex) costs is a particularly intractable problem.
- ▶ Business As Usual is unlikely to generate the volume or type of finance necessary for future investment in water infrastructure. Nor will present efforts to finance recurrent costs cope with the rapid growth of such costs in future.
- ▶ Much can and should be done to improve the efficiency with which water infrastructure is planned, operated and maintained, and to achieve the right balance between infrastructure of different types (including “green” as well as “grey” solutions). This will minimise the large capital sums required, improve operating efficiency and cash flows, and improve the ability of water to attract finance.
- ▶ Current practices in the appraisal and choice of multi-purpose water infrastructure (MPI) do not reflect its long term economic benefits nor its contribution to tackling water risks. This important infrastructure class tends to slip between the cracks in the professional and operational set-ups of financing institutions.
- ▶ Water financing needs to have a better database in order to provide a firmer benchmark from which to judge future financial requirements, and to monitor future progress. Further investigation is needed of the level of current expenditure on water and the sources of its financing.

PROGRESS SINCE PREVIOUS HIGH-LEVEL REVIEWS

In a global perspective, some water financing systems are coherent and working well, and there are many examples of innovation in this area.⁷⁸

The USA has long and successful experience with the state revolving fund system and the widespread issue of municipal bonds based on the “tax incremental finance” principle. The USA also provides epic examples of major infrastructure projects, funded largely from public means, which had had a transformational impact on regional development – the Columbia River Treaty, the Hoover Dam, Tennessee Valley Authority, Mississippi River Flood Control Project and others. These mega projects have amply justified their outlays through their long term impact on economic growth as well as the avoided costs of water-related disasters (delli Priscoli & Stakiv, 2015 (seen in draft)).

Notwithstanding the above, the USA lacks the resources in future to continue federal financial support at historical levels, especially for the heavy cost of rehabilitating existing infrastructure, and is looking for greater partnership with private contractors and a more targeted approach to maintaining existing assets.

Brazil has a well-established system for channelling pension contributions into infrastructure, including water supply and sanitation. It exemplifies the co-existence of public and private models of water services, with almost a quarter of its population now being served by private water companies, in various forms. In Brazil giant public development banks are heavy lenders to water projects, in a symbiotic relationship with major private banks.

China has witnessed the active and long-sighted involvement of large public development banks as the cornerstones of strategic multi-purpose projects (e.g. Xiaolangdi Dam, the Three Gorges Project, and the South-North Water Conveyance). Provincial and local governments have also raised large sums from bank loans and other sources, much of it through local infrastructure “platforms”. With the aim of curbing excessive indebtedness and creating more control and

transparency of local finances, the Budget Law enacted on Jan 1, 2015, allows local governments to issue bonds for development purposes. China also exemplifies the pragmatic use of the expertise of private companies in urban water and wastewater services and now accounts for a high proportion of total global water PPPs.

In Europe, Denmark, the Netherlands and France have a high degree of internal cost recovery for water (the Netherlands also having a dedicated water bank). In England and Wales private finance, repayable from tariff revenues, has replaced public funding completely for water services (though not for flood management), while in the EU full cost recovery from users of all water services is gaining ground.

Turning to specific financial mechanisms, there have been successes with a national revolving fund in the Philippines, and with bond pooling by municipalities in the Indian state of Tamil Nadu and in Colombia. The principle of Results-Based Finance has been applied in Brazil for the promotion of wastewater treatment plants through the PRODES scheme, and on a smaller scale in a growing number of countries with Output-Based or Performance-Based Aid in water supply and sanitation.

There are also remarkable cases of water utilities transforming themselves into commercially-oriented entities able to raise sufficient capital from market sources by leveraging their own enhanced cash flows (the Ugandan NWSSC and the Phnomh Penh utilities are among the best known cases, but there is a growing number of others).

For infrastructure finance more broadly, positive developments include the growing interest of “patient” investors such as pension and insurance companies and Sovereign Wealth Funds, as well as the growth of funds aimed at “green” causes. So far, however, this interest has not translated into any substantial uptake of water securities. The imminent arrival on the scene of the Asian Infrastructure Investment Bank, the BRICS Bank and other new development banks will also create financing opportunities for water infrastructure.

78 Tremolet (OECD 2010) reviews a number of innovative financing products and schemes

REMAINING PROBLEMS

Despite the positive features mentioned above, there are many respects in which the present system of financing water infrastructure falls short in relation to the task described in earlier Chapters.

As in other parts of this Report, the situation differs according to the type of water infrastructure in question. In particular, there are important differences between financing revenue-earning water services such as water supply and sanitation, on the one hand, and major projects of strategic infrastructure, including multi-purpose schemes, on the other.

Water supply and sanitation services

Current spending on water is below the level required, as determined by many objective assessments. In sub-Saharan Africa, for instance, only 0.32% of GDP was spent on water supply and sanitation, compared with objective needs assessed as 2.58%. (Rodriguez *et. al.* 2012, p. 9).

Counter-intuitively in view of the above, *existing water budgets* tend to be underspent. In Africa according to a recent study the average actual spending of *watsan* budgets is only 66%.⁷⁹ This may point to bottlenecks in the process of planning, financial management and project implementation at local levels, rather than a shortage of finance *per se*.

The supply of *ODA and other concessional funds* for water and sanitation is highly fragmented. Ministries of Finance and Water in developing countries have to deal with dozens of different official agencies, not to speak of many more NGOs, each with their own requirements for appraisal, monitoring and accounting. ODA for water is notoriously slow to disburse.⁸⁰

Fragmentation is also a problem on the *demand side*, where smaller towns and communities fail to provide a minimum threshold size of financial transaction to appeal to IFIs, commercial lenders or institutional funds.

The recurrent costs of infrastructure and services (O&M) are widely under-financed, even in many OECD countries. Poor cost recovery is a general problem, and there is resistance by consumers to increased tariffs, and a reluctance by politicians to charge them. This results in inefficient operation, malfunctioning assets, and premature obsolescence requiring wasteful early replacement and major rehabilitation.

The supply of finance for water: attitudes & perceptions

Although there has been a strong flow of finance into other capital-intensive sectors such as transportation, telecommunications and energy, this has been much less evident for water and wastewater. Water tends to be the smallest and most problematic part of the project finance and PPP markets, compared with other infrastructure categories.

Important traditional sources of funding – especially commercial bank lending and ODA – have been stagnating or declining. The market for project finance was badly affected by the 2007/8 financial crisis and by changes in the supervisory regime for international banks affecting their capital provisioning for loans to infrastructure projects.

Potential financiers perceive water governance as weak, with archaic institutions, a poor enabling environment for private participation, and widespread corruption (WIN & Transparency International, 2010).

There is anecdotal evidence⁸¹ from some donor agencies and IFIs that difficulties in implementing and disbursing funds for water projects leads to them being given lower priority amongst operational staff.

Only a miniscule amount of the holdings of institutional investors and Sovereign Wealth Funds are in water securities. Pension funds invest only 3% of their global assets in infrastructure, and water would be a very small part of this (ICESDF, 2014, p. 35). There seem to be too

⁷⁹ Rodriguez *et. al.* 2012.

⁸⁰ Studies done by the OECD's Development Assistance Committee in 2004-5 revealed an average disbursement period of DAC Members' ODA for water supply and sanitation of 5-7 years, and even longer for some projects (personal communication)

⁸¹ Personal conversations in the course of preparing this Report

few “bankable” projects of a scale and status to attract the large volume of finance that is potentially available for infrastructure from these savings institutions. This reflects underlying weaknesses of governance and commercial orientation across the water spectrum. Box 8 illustrates some common attitudes.

Box 8. Perceptions of water as a target for finance

“..some large investors complain that often they are unable to invest in the [African] continent due to a lack of bankable projects. Traditionally, large institutional investors only look at investment proposals worth \$100 million or more.”

(FT, May 2, 2014)

“..there are plenty of funds for well-structured projects”

(from a major IFI at the *money2water* conference, London, May 2014)

The large future financial requirement for water infrastructure estimated in many reports (Chapter 2) is difficult to reconcile with the shortage of bankable water infrastructure projects as reported above by lending institutions.

Other concerns

Despite the existence of a number of facilities for this purpose (e.g. ICA, 2006), funding for project preparation and financial packaging still appears to be a problem, especially for larger schemes.

The role of donor agencies and IFIs *vis-a-vis* each other and in relation to commercial financiers raises issues of “cherry-picking” good projects, “crowding out” commercial involvement, and other concerns. There is also uncertainty about the likely impact of the new international facilities and infrastructure banks that are being formed, and whether they will lead to a “race to the bottom” in respect of lending standards and conditionality.

There is major scope for efficiencies throughout water infrastructure and services (McKinsey, 2013). Major investment projects suffer from poor cost control and

risk management (Ansar *et. al.* 2014), while existing infrastructure is operated inefficiently and wastefully,⁸² at the expense of cash flows.

Multi-purpose and other major strategic water infrastructure

It is more difficult to draw general conclusions about MPI and other large strategic water projects since each tends to be *sui generis*. The recent stagnation of project finance and the dissipation of the specialist teams in banks that used to deal with this is not a propitious development (Sachs & Schmidt-Traub, 2015). As against this, the recent re-engagement of the IFIs (World Bank and the regional development banks) in lending for major infrastructure projects is welcome in view of the expertise and leadership they can bring to this topic. The growth of global savings, and their search for “yield”, also creates opportunities for attracting funds from institutional investors and Sovereign Wealth Funds.

In practice *Governments and public development banks* have been prominent in most of the major water infrastructure projects recently completed or under implementation. Banks and institutional investors tend to have been involved as minority partners, if at all, in these deals, taking up specific financing niches. More extensive involvement of commercial finance typically relies on public guarantees or other financial incentives. Many BOT projects rely on offtaker contracts with public authorities to deal with their demand risk.

This Report argues for greater investment in water infrastructure, and this implies more public finance. To get this in the required amounts, attitudes and criteria will need to change. The nature and time profile of the benefits from major water schemes differ from those typical of other kinds of economic infrastructure such as power, transport and telecommunications. If standard economic benefit-cost criteria were applied water projects would often be at a disadvantage. This is partly because some of their benefits are intangible, difficult to monetise, and do not promise early returns to the public finances. It is also partly due to the *discount rate*⁸³ applicable to projects of great longevity with delayed, but substantial, benefits.

82 A decade ago the central Government in China ordered the construction of hundreds of wastewater treatment plants in large cities. These were practically all built on time and to the right specifications, but one year after completion only half of them had started operation. This was attributed to the fact that “Building the plant was a major profit centre for the local officials, but putting it into operation made it a cost centre”. Jamil Anderlini and Gu Yu, *Financial Times*, Nov 14, 2013, p. 11.

These factors, especially the validity of benefit-cost analysis for this type of project, and the appropriate value of the discount rate (Jeuland, 2010), are controversial and raise issues beyond the scope of this Report. However, the findings of the GWP/OECD (2015) Task Force on Water Security and Economic Growth offer a framework for planning and appraising investments addressing hydrological risk. Amongst other points, the Task Force recommends risk management as a key criterion in investment choice, and the planning of investments in sequences (“pathways”) of projects, rather than treating single projects in isolation.

IFIs and public infrastructure and development banks may need to reconfigure their professional and operational arrangements for dealing adequately with major MPI projects. A specific deterrence at present is the high degree of social and environmental compliance procedures entailed by these projects, involving greater effort and longer delays, compared with projects of other kinds.⁸⁴ The greater use of guarantees and other risk mitigation instruments in IFI lending requires expertise that few institutions possess, and, where it exists, often runs up against internal obstacles.

Commercial banks and private equity funds typically have a time “horizon” for their loan or investment which is well short of the period required for a major infrastructure project to be implemented and to show its benefits. Recognising this “short termism” implies creating niches in a project finance structure that could include banks and equity funds, such as for export credits, construction finance, refinancing completed projects, etc.

Institutional finance tends to be more “patient”, and indeed is attracted to assets promising stable long term cash flows that match its financial liabilities.⁸⁵ However, the benefits of MPI projects are often unpredictable and difficult to fully monetise. The growth of rated securities (equities and bonds) issued by water utilities and Special Purpose Vehicles will attract more institutional finance, but not all projects will be of sufficient *investment grade* for this to happen.

There is ample scope for financial engineering in structuring project finance in order to involve commercial (“private”) finance, but such schemes usually pivot on public backing in one form or another. Many Governments have reduced their budgets for public infrastructure due to fiscal pressures and have pinned their hopes on private finance to fill the resulting gap. However, private money can rarely fully substitute for public finance in major water infrastructure – it can only be a junior partner in most cases, and even then will need comforts of various kinds.

83 The inverse of an interest rate: the % rate at which future costs and benefits are written down (discounted) reflecting society’s preference for early rather than delayed returns, and the cost of foregoing interest earnings on the capital employed in the project. See Jeuland (2010) for a recent sortie into this controversial area.

84 Since 2000 the two flagship hydropower projects of the World Bank – Nam Theun 2 in Laos and Bujugali in Uganda – both took over 10 years between the start of preparations and completion of construction. In the USA “the Endangered Species Act makes the building of any infrastructure very difficult and has been, and can be, invoked to stop virtually any large water project, no matter what the social and economic returns from that project”. (Briscoe, 2011)

85 E.g. the UK Government is selling its 40% equity stake in Eurostar (the company operating train services to France and Belgium through the undersea tunnel between England and France) to the Quebec Pension Fund and an asset manager owned by the BT Pension Fund. *FT* 4 March 2015, p.2

SCALE OF PRESENT FINANCE RELATIVE TO FUTURE NEEDS

The inevitable questions are,

Is the current water financing system equal to the task of funding estimated future infrastructure needs?

Is a step change necessary in financial provision for water?

Are radically new approaches and sources called for?"

Giving a satisfactory answer to these questions is difficult:

- ▶ There is no clear baseline for *current* levels of spending for water infrastructure as a whole. The situation is clearest for urban water supply, sanitation and wastewater, but global data on irrigation, non-networked (including rural) services, water storage and water resources management is incomplete.
- ▶ There is a problem of categorisation, since much spending on “water” is included in power and energy, agriculture, environment, and other sectoral headings.⁸⁶ For multi-purpose infrastructure (typically involving hydropower, irrigation, flood control, and other aspects of water resource management) the allocation of costs and spending between the different purposes is an obvious difficulty.
- ▶ There are wide variations in different estimates of future costs, as noted in Chapter 2.
- ▶ Some of the financial sources, especially the various kinds of institutional investors and funds, are likely to be extremely “elastic”, and well able to accommodate a growth in bankable projects presented by creditworthy companies and institutions. But this merely pushes the question back to the likelihood of a sufficiently large flow of such projects materialising.
- ▶ Some of the most easily identifiable financing sources (e.g. ODA, IFI lending, water bond issues) are small in absolute terms in relation to the size of likely current and estimated future costs (though this is not

to denigrate their importance in other ways to the solution of the funding issue).

The scale of existing spending on water

A comprehensive assessment of the level of *current* spending (and by implication the amount being financed by various means) is an important first step in assessing the likely funding “gap”. This is beyond the scope of this Report, but a few pointers can be offered:

- ▶ Estimates at global scale of the O&M and capital expenditures of (mainly) urban utilities on water supply, sanitation and wastewater are a robust minimum estimate (\$216 billion for capex and \$317 billion for opex, totalling \$533 billion in 2014 in the GWI database). This can be related to the estimated global market for capital expenditure on water equipment of \$655 billion for the whole period 2013-18 (*Global Water Market, 2014*) ;
- ▶ To this should be added estimates of spending on water and sanitation services for populations not currently served by utilities. Most of these would be in developing and emerging countries;
- ▶ The level of private spending on water by users is relevant to the calculations. “In a few years’ time, the amount consumers spend on bottled water, household water storage and treatment systems, private boreholes and informal water vendors will overtake utility spending”.⁸⁷
- ▶ Estimates of spending on water supplies should be added for non-household sectors not supplied by networked utilities. These include agriculture (surface and groundwater), industry, mining, tourism, power and energy, and other productive water users.
- ▶ An assessment should be made of the strategic costs of providing water security (reducing water risks) which cannot be solely attributed to specific sectors such as power and agriculture.⁸⁸ This would be a particular issue for the sizeable investment in dams and flood protection that is now going on.

86 This is the case for the Africa Infrastructure Country Diagnostic (AICD) exercise (Foster & Briceno-Garmendia (2010) where cost and spending estimates for irrigation and hydropower are indeterminate.

87 Christopher Gasson, in *Global Water Intelligence*, January 2015.

88 This question was tackled in the AICD (2010) exercise, one of the most comprehensive recent assessments of the needs and cost of water infrastructure, in this case for Africa. The costs of water storage for water security were disentangled from capital estimates for hydropower, water supply and irrigation, and estimated to be c. \$10 billion p.a. for 2006-2015. (Foster & Briceno-Garmendia, eds., 2010, p. 281)

- ▶ An estimate of global investment in Water Resources Management and Development should be added. Global investment in watersheds of \$9.6 billion has been estimated by the Ecosystem Marketplace initiative (Bennett & Carroll, 2014).

In addition, several estimates have been made of present spending and future spending needs for specific countries and regions. The FinTrack programme of GLAAS and WHO continues to identify water expenditures in

individual countries and the Global Agenda Council on Water of the WEF has also produced (so far unpublished) estimates.

- ▶ Current efforts to assess the extent, and sources, of spending on water (opex and capex), such as FinTrack and the GACW, should be supported and extended in order to provide a firmer benchmark against which future requirements can be judged. ■



CHAPTER 6

AIMS AND PROPOSALS

MAIN POINTS MADE IN THIS CHAPTER

This Chapter sets out seven aims for influencing national and international debate on the finance of water infrastructure. Proposals are made that would contribute to the achievement of these aims.

The aims are as follows:

- ▶ Make a more compelling economic case for investment in water security as an essential requisite for national economic growth
- ▶ Scale up investment and finance for multipurpose water infrastructure
- ▶ Create the constructive enabling environment of policy, governance and regulation
- ▶ Make best use of markets, competition and innovation
- ▶ Promote greater efficiency in water investment and management
- ▶ Offer financiers a better balance of risk and reward
- ▶ Improve the use of existing financial sources & secure access to the new ones

More specifically:

- ▶ A much stronger case has to be made about the strategic and economic benefits from investment in water, as well as its financial returns. These arguments must resonate with senior economic and financial policy makers
- ▶ Specific actions are proposed as part of a New Deal for investment and financing of multipurpose infrastructure
- ▶ Water infrastructure will not develop fully without a sound “enabling environment” comprising policies, governance and regulatory systems.
- ▶ Water has a burdensome legacy of technology, institutions and business models that block the rapid and drastic changes that will be required. Technological changes, the removal of barriers to the diffusion of innovation and new business models are urgently needed, and should be encouraged by all means.
- ▶ There is great scope for making water agencies and service providers more efficient, which will enable them to be “fit to finance”. As part of this agenda, proposals are made to improve financing of the recurrent costs of operation and maintenance.
- ▶ In order to receive a greater share of funding from both existing and new sources, water sponsors need to become more creditworthy, and their projects more “bankable”. The “risk-reward” calculus offered by water needs to be improved. Water projects entail specific risks, which should be properly allocated and mitigated
- ▶ More finance is potentially available from existing sources, provided more resources are devoted to pre-project preparation and that lenders make their balance sheets work harder to leverage more co-financing. Facilities that blend different kinds of finance are potentially valuable.
- ▶ There is great scope for obtaining more financing from some of the newer sources of funds for infrastructure such as institutional investors (pension & insurance funds, etc) Sovereign Wealth Funds, specialised water funds, Green Bonds, climate funding, and the proceeds of urban property development. There are also several new and proposed international infrastructure development banks.

THE AIMS

The previous Chapter drew attention to shortcomings in current systems of water financing which would limit the future level of investment, unless addressed. It also indicated opportunities and promising initiatives that need to be taken up and encouraged.

In the light of this analysis, this Chapter sets out seven aims for influencing national and international debate on the finance of water infrastructure. Proposals are made that would contribute to the achievement of these aims.

The aims are as follows:

- 1 Make a more compelling economic case for investment in water security as an essential requisite for national economic growth
- 2 Scale up investment and finance for multipurpose water infrastructure
- 3 Create the constructive enabling environment of policy, governance and regulation
- 4 Make best use of markets, competition and innovation
- 5 Promote greater efficiency in water investment and management
- 6 Offer financiers a better balance of risk and reward
- 7 Improve the use of existing financial sources and secure access to the new ones

MAKE A MORE COMPELLING ECONOMIC CASE FOR INVESTMENT IN WATER SECURITY

Allocating more finance to water depends on the people involved in the financing decision being convinced of the importance of investing in water, and persuaded by the economic and financial returns from those investments. At present, neither seems to be the case.

For water, there is a glaring gap between the rhetoric and the reality. There is no lack of rhetoric about the vital importance of water and the seriousness of the water challenges facing several billions of the world's population.

In its *Report on Global Risks 2015*, the World Economic Forum ranked “water crises” first in terms of impact on societal and economic risk for the next 10 years. The Founder and Executive Chairman of the WEF has described water security as “one of the biggest issues facing the world in the twenty-first century”.⁸⁹ The Chairman of Nestle has described water scarcity as “far more urgent than global warming”. He adds, “even without climate change we are running out of water and this has to become the first priority”.⁹⁰

The reality is very different. Water is sometimes described as the “Cinderella” sector, orphaned and neglected by governments, development agencies and financing institutions. Earlier chapters of this report contain a litany of underspent budgets, niggardly financial allocations, and the marginalisation of water within the portfolios of banks and other financing bodies. All this adds up to the apparent lack of any real conviction on the part of key policy-makers that water is a vital investment proposition. In economic terms, there is a gulf between the “stated preferences” of policy-makers and their “revealed preferences” uncovered in their actual decisions.

To some extent this dissonance is due to a failure to reckon the full “value” of water in economic terms, made more difficult by the long life of water infrastructure and the lengthy periods over which it delivers benefits. There is the further need to capture this value in financial returns that would resonate with Finance Ministers and financial

⁸⁹ Cited in Waughray (ed) (2011)

⁹⁰ Peter Brabeck, *Financial Times*, July 15, 2014, p. 1

institutions. Both of these issues need addressing, and much of this Report is concerned with the second of these issues – making water a better financing proposition. However, this section focuses on the prior issue of how to raise the strategic and economic status of water in the minds of key decision makers.

The lack of water security poses a serious risk to economic growth. This is the result of a major research study conducted under the auspices of the Global Water Partnership and the OECD. Hydrological risk can be managed in various ways, and investing in infrastructure is a key element in this. Having adequate water infrastructure is a central part of making a society resilient to climate change.

“Water security is a statistically significant causal factor in economic growth....Hydrological variability is the key hydroclimatic factor with regard to economic growth and its effects reach across all economies”

(From a presentation by Dr Claudia Sadoff at the OECD’s Global Forum, Nov 2014.)

Viewed at its broadest level, the development and management of major water infrastructure has been an important factor in the institutional development of countries throughout history.

Raising the priority of water in national investment and financing programmes

In order to give prominence in key decision making circles to the evidence of impact of water infrastructure on economic growth and regional development, it is recommended to:

- ▶ develop a communications strategy for spreading evidence of the link from water to growth, starting with results from the Global Dialogue on Water Security and Sustainable Growth of GWP and OECD⁹¹.
- ▶ Complement benefit-cost decision criteria with the use of “stories” illustrating the above in graphic social, economic and human terms.

- ▶ In development financing institutions (e.g. IFIs, donor agencies) targetting economists and other influential decision makers as a key target group for the abovementioned communications strategy and ensure they are well informed and “on-message” when it comes to allocating resources to water in relation to other sectors when setting country strategies and sector spending targets. This should include placing appropriate values on the *external and less tangible benefits* from water investments in project benefit-cost analysis.
- ▶ Using insights from the “Nexus”, building professional and advocacy links with other key sectors and linked issues (energy, industry, agriculture, environment, climate change etc) to create joint initiatives that add weight to the case for water investment.
- ▶ Encourage NGOs, educationalists, civil society bodies & “grass-roots” organisations to create a groundswell of opinion to get water development a higher place on the development agenda. The on-going discussions to finalise the Sustainable Development Goals, and the Conference on Financing for Sustainable Development scheduled for Addis Ababa in July 2015, would be opportunities for such advocacy.

Engaging corporate business

Over the last decade corporate business has been prominent in raising alerts about the risks to their own operations, and to society at large, from water-related risks. Businesses and their representative organisations have a powerful voice in making the case for water, and its impact on incomes and jobs, through such means as the following:

- ▶ In their own domains, promoting “good housekeeping” and stewardship of water, including further work on identifying their “water footprints”⁹² and taking appropriate actions.
- ▶ Developing indicators of “water risk” to their operations, including Value At Risk metrics to help quantify their dependence on water, for the information of their shareholders, customers and

91 See also Quick & Winpenny, 2014

92 E.g. through the Water Footprint Network.

other stakeholders.

- ▶ Wider engagement in water development in communities and regions where they operate, e.g. direct investment in, or co-funding of, projects of concern in order to secure their resource, customer or operational base.
- ▶ Using publicity, information and awareness-raising in corporate and official circles, including the Global Agenda Council on Water of the World Economic Forum, the World Business Council for Sustainable Development, the National Contact Points for the OECD Guidelines for Multinational Enterprises and other fora.

Engaging with civil society

- ▶ Stakeholders should be consulted since they have a role to play, to voice the level of security they deem appropriate, how much they are willing to pay for it, to ensure an acceptable distribution of risks.

SCALE UP INVESTMENT AND FINANCING FOR MULTI-PURPOSE WATER INFRASTRUCTURE

MPI compounds the financing challenges for water projects. Many of the “easy” solutions for single-purpose water projects have been taken up and future options are far more likely to involve schemes that have to juggle several different purposes. This applies to projects of all scales, but especially to larger schemes because of their greater scope and impact.

MPI typically combines the provision of public as well as private goods, some earning no direct financial revenues (flood protection, wetland conservation), and others with revenue streams of various sizes (hydropower, irrigation, drinking water). These different services, which may or may not be provided by a single company, agency or Special Purpose Vehicle, are financed in different ways. The challenge for MPI sponsors is to make the internal financial structures of MPI schemes transparent and viable. These challenges are further compounded where MPI is also transboundary.

A New Deal for MPI as an investment category

The challenge of water MPI needs to be confronted head-on. MPI needs to be acknowledged as an important and growing investment category, worthy of special focus. At present, it is more often treated as a “special case”, falling between traditional sectoral categories – water, energy, industry, agriculture, environment, etc. - and failing to be given the attention it increasingly deserves.

While each major MPI financing deal is unique, and is likely to remain so, the construction of these deals would be facilitated if banks, IFIs and other financing agencies recognised MPI in their institutional structures and professional resourcing. A good start would be to link water and energy departmental groups (and possibly others with close links to water) to create synergies and critical mass, and to give practical expression to the notion of the Nexus.

87 Christopher Gasson, in *Global Water Intelligence*, January 2015.

88 This question was tackled in the AICD (2010) exercise, one of the most comprehensive recent assessments of the needs and cost of water infrastructure, in this case for Africa. The costs of water storage for water security were disentangled from capital estimates for hydropower, water supply and irrigation, and estimated to be c. \$10 billion p.a. for 2006-2015. (Foster & Briceno-Garmendia, eds., 2010, p. 281)

A start has been made in the World Bank's newly formed Global Water Practice, which unites more than 300 of its water professionals in a single professional structure which recognises the cross-sectoral and multi-purpose nature of water. This is a start in overcoming the "compartmentalism" or "silo" mentality which dogs the development of MPI in some organisations. The AfDB targets MPI in its 10-year Water Strategy and follows a holistic approach to financing, within a framework of good governance, technology and skills development, and sustainability.

- ▶ IFIs should consider the creation of a special group of staffers specialising in the complex financing structures that characterise MPI projects. The World Bank's Financial Solutions Unit may be worthy of emulation by others.
- ▶ Banks and IFIs should consider linking their water and energy departments, and possibly other sectoral groups with close links to water, in order to break down the "silo" mentality, and to create synergies and critical mass, and give practical expression to the Nexus mentality.
- ▶ IFIs and other financing agencies should follow a *holistic* approach to financing MP projects, seeking to promote a framework of good governance, technology, skills development, and sustainability

MPI could be given greater prominence in development financing circles by:

- ▶ Encouraging the PPIAF⁹³ to focus on MP water infrastructure as a separate category in its database and analytical work.
- ▶ Greater publicity for exemplary and successful financings of MPI projects⁹⁴

IFIs can have a "value-added" role in MPI going beyond their direct financial contribution – as project consortia convenors and leaders, in providing the "halo" effect to

provide comfort for other financiers, in funding studies & project preparation, and in setting good international standards for procurement, management, etc. IFIs could intensify their co-funding with other lenders in order to put their "halo effect" to greater advantage.

- ▶ IFIs have a particularly vital role at the early stages of transboundary MPI projects, e.g. by convening Round Tables of potential financiers.

Choice of Business models and financing arrangements for MPI⁹⁵

Many earlier major MPI projects were financed and implemented by governments and public agencies. In the USA the Hoover Dam and projects of the Tennessee Valley Authority are classic models of this approach, as are recent major projects in China. More recently other options have been implemented, partly due to financial necessity (e.g. USA) and partly to a realisation of the advantages and opportunities of different approaches.

The broad choice of business model for MPI projects is between exclusively public sector ventures, or the various kinds of public-private partnerships. (A third option, exclusively private development, is rare for MPI, though not unknown for single-sector hydropower projects).

Assuming that the project is *economically viable* and a government priority, the decision between the two hinges on several key factors: whether it is financially viable on its own; if not, whether an overt and sustainable subsidy is available, the nature of the risks it entails, and the extent to which these risks can be mitigated. There is the further decision on ownership of the assets. If a PPP is chosen, various types of contract can be selected, ranging from management and operating contracts to the various kinds of concession contracts (BOTs, BTO/ROMs, DBOTs, etc).

A *public sector option* may be chosen if:

- ▶ the project is too large and complex to attract private sector investment,
- ▶ the site risks are unacceptably high,

93 Public-Private Infrastructure Advisory Facility, c/o the World Bank and IFC

94 E.g. the Thakwe Dam in Kenya. <http://www.afdb.org/en/projects-and-operations/project-portfolio/project/p-ke-e00-008/> and the San Roque Multipurpose Project in Philippines & Nam Theun 2 Multipurpose Project in Laos, both discussed in [OECD 2015b]

95 This section draws on OECD 2015b (seen in draft) as well as Head (2006).

- ▷ the commercial risks cannot be mitigated, or
- ▷ the “enabling environment” is lacking.

Conversely, PPPs may be an option where:

- ▷ sufficient risk mitigation is available,
- ▷ it is feasible to split the project between financially-profitable and other components - with private partners taking the former and the state keeping the latter or
- ▷ the public authorities can provide a subsidy.

The situation has been summarised as follows:

“..capital expenditure for greenfield multi-purpose dams in the developing world is typically partly funded by public authorities, with possible international donor support. Attracting private investors to finance multi-purpose projects is becoming increasingly relevant but difficult due to their inherent complexity. In particular, conflict of interests among the different uses, e.g. hydropower requiring maximum storage levels and irrigation causing lower levels, result in complex and potentially vulnerable contract structures. Often, promoting a single purpose dam, especially for hydropower, may be more financially attractive to private investors as it promises fewer risks and secure financial returns on investment.”⁹⁶

MPI is not synonymous with dams or other forms of physical infrastructure. However, dams are very commonly involved in MPI and financing these expensive structures illustrates the wider problems of MPI.

The International Commission on Large Dams (ICOLD) estimates that 30% of all global dams and their associated reservoirs are multi-purpose. The *main purpose* of these MPI dams in each case breaks down as follows: irrigation (24% of all cases), hydropower (16%), water supply (17%), flood control (19%), recreation (12%), and navigation and fish farming (7%).⁹⁷

Some of the above uses provide no direct revenues. Of the revenue-earning uses, hydropower is typically the most lucrative, and is the main prop of MPI financing

where it is involved. Hence the search for solutions to MPI finance is closely bound up with investment and financing for hydropower. However, even this is not straightforward: 27 separate financing institutions were involved in the financing of the Nam Theun 2 Project, in which hydropower was the main output and revenue generator.

- ▶ Public authorities are normally heavily involved in sponsoring MPI projects but the involvement of private partners through PPPs can be advantageous. A number of contractual forms are possible, depending on the nature of the project and the financing options available.

The internal financial structure of MPI projects is important to the financial viability of the whole. Many MPIs are structured so that cash generated by their more profitable parts (e.g. hydropower) are available to cross-subsidise unprofitable or less-profitable elements. This is a pragmatic solution to sustainable cost recovery for the less profitable components, and it may be the only feasible solution in certain cases. However, an excessive degree of cross-subsidy tends to create distortions in the relative demand for the different services, and could make the search for financing of the profitable parts more difficult.

- ▶ Transparency over the internal finances of MPIs is desirable. While some cross-subsidy from revenue-earning activities to others is probably inevitable, an excessive amount becomes a serious drag on the ability of the revenue-earners to attract financing on the best terms. An explicit public subsidy for non-revenue earning items is preferable.
- ▶ Private contractors will need cover for hydrological risk, e.g. a clear operating protocol for the MPI which sets out the priorities for the use of water in the event of scarcities, or alternatively compensation for any shortfall in their agreed water allocation..

Financing packaging for MPI projects needs to contain a variety of types of finance, both grant and loan, short and long term, public and private, as befits the cost structure

⁹⁶ OECD (2015b) seen in draft.

⁹⁷ website of International Commission On Large Dams-ICOLD

and revenue profile of the project. Institutions able to blend different types of finance for a single project, such as the EU-Africa Infrastructure Trust Fund, and the new Africa50 fund of the AfDB, are particularly useful for this. “Bundling” disparate projects under a overarching authority such as a river basin organisation may be one solution.

- ▶ Blending different types of finance into a single “offer” can save transactions costs from the host country’s point of view.
- ▶ “bundling” a number of lesser projects into a larger project or investment plan can overcome the high threshold costs entailed in project finance or bond issue.

MPIs which are destined to be loss-making – after all feasible attempts to increase efficiency and raise internal revenues have been made – can be dealt with by Viability Gap Finance, which accepts the existence of financial deficits and devises methods of funding these gaps. One such method is to invite private partners chosen on the basis of the minimum level of subsidy they would require.

- ▶ Governments and their financing partners can use Viability Gap Finance as an approach to producing a financing package for MPI projects that are unlikely to achieve overall financial surplus.

A number of the proposals made elsewhere in this Chapter are relevant to this issue (e.g. on co-financing, use of guarantees and private involvement).

In the case of *transboundary* MPI projects, which are typical of many larger schemes, agreements on benefit-sharing between the member states underpin the finances of these projects (e.g. in the Columbia River Treaty between USA and Canada). In the OMVS project in West Africa, prior agreement on the size of likely benefits (in various categories) for the three countries concerned define the share of the project’s total debt guaranteed by each of the countries.

- ▶ In transboundary MPI projects Governments, with the help of development partners, need to agree on a key for their share of financing costs based on the size, composition and distribution of benefits.

The case for a Public Goods Charge (PGC)

A case has been made for levying an explicit and transparent PGC on consumers of water (and other public utilities such as power and energy) who are likely to benefit from the provision of public goods from their service provider. This was the situation in California from 1998 to 2011 where a PGC was levied by the three main electricity Investor Owned Utilities, raising \$5.8 billion over that period for Public Purpose Projects such as the development of energy-efficient methods and research and development. A PGC has also been collected since 2002 by the Metropolitan District of Southern California, a consortium of 26 cities and water districts, for Public Purpose Projects in conservation, recycling, groundwater clean-up and other local resource management programmes. The PGCs for both power and water add a few percentage points to consumers’ utility bills (Quesnel & Ajami, 2015).

The background to the introduction of PGCs is the growing difficulty in California of raising finance to cover the provision of public goods in energy and water, and limitations in the use of General Obligation Bonds – the traditional means of funding public goods. GOBs have proven to be unreliable, due to the need for voter approval, which causes delays and often reductions in the amounts needed, and they do not provide a regular flow of revenue. PGCs, in contrast, provide regular and predictable revenues, and are justified on the Beneficiary Pays principle, since they are targeted to users of the services giving rise to the need for the public goods in question, rather than to the body of tax payers as a whole. The key to the acceptance of PGCs by utility consumers has been the transparency in collection and use of the revenues for the stated purposes. In addition, both power and water issues have a very high profile in California and the need for innovation and conservation is widely understood. In such a context, and where transparency in collection and use of the proceeds can be assured, the PGC can be an attractive solution.⁹⁸

98 The eventual cessation of the electricity PGC in 2012 was related to poor documentation about the uses of revenues and the benefits of the PP programmes.

- ▶ Financing public goods through an explicit and transparent charge on consumers utility bills can be an effective solution in situations where there is sufficient consumer assent and credibility in the programmes being funded.

Procurement

In procurement for large water infrastructure projects, it is common to ask short-listed bidders to include financing proposals together with their technical bids. While this shifts the task of assembling the financial package to bidders, it will not necessarily produce an optimal outcome from the host client's viewpoint. A seemingly attractive financial offer may be tied to procurement that is not the most competitive, nor the most suitable to the client's needs.

In some procurement processes, the bids for goods, works and services are judged independently of the financing offers they come with, and the winning bidder for the "physical" procurement is matched with the best financing offer. Where this is feasible it would appear to offer the best of both worlds (although it may not be possible where the financing offers are "tied" to specific sources of supply).

- ▶ International competitive bidding offers the best prospects of value-for-money for complex MPI projects
- ▶ For public sector clients, procurement bids for major infrastructure should be assessed independently of any financing offer. Where feasible, the best procurement offer should be preferred, and the financing for this should be optimised separately.

CREATE THE CONSTRUCTIVE ENABLING ENVIRONMENT OF POLICY, GOVERNANCE & REGULATION

Policy

A precondition for successful water development is the existence of a sound policy framework which creates the right *enabling environment* for all actors and stakeholders.

- ▶ It is recommended that Governments review their policy framework for water to provide clarity about national objectives, and to create the laws, institutions, incentives and other aspects of the *enabling environment* necessary to induce investment and the means of financing this. This policy framework⁹⁹ should include, amongst other components:
 - ▶ Adoption of **strategic plans** for water sector in the medium/long term, expressing the government's vision for water and setting out targets and goals aligned with broader economic and social development plans.
 - ▶ Defining a **legislative framework** for water, including a legal regime for water services and their regulation, principles for tariff-setting, quality of service, quality of water, consumer protection, competition, etc.
 - ▶ Establishing an **institutional framework**, creating clear responsibilities for the public agencies involved, the means of regulation, and the respective roles of agencies concerned with environmental, water resources, health, consumer protection and competition issues.
 - ▶ Setting realistic **targets** for access and **goals** for the quality of service.
 - ▶ Setting out **tariff and tax policy**. The tariff policy should aim to move progressively towards cost recovery, while recognising social obligations towards poorer consumers.

⁹⁹ Drawing on a memorandum by Jaime Melo Baptista for the HLP, 10 Dec, 2014

Governance

In the context of water, governance has been defined as the range of institutional and administrative rules, practices, and processes (formal and informal) through which decisions are taken and implemented, stakeholders articulate their interests and have their concerns considered, and decision-makers are held accountable for the management of water resources and the delivery of water services.¹⁰⁰ Governance is about “who does what, when, why, at which level and how”.

Governance is a means to an end. Good governance should deliver beneficial outcomes for society, the economy and the environment. It should support the design and implementation of policies that are consistent with the long-term goals of water security, in a sustainable, integrated and inclusive way, at an acceptable cost, and in a reasonable time frame. There is not a one-size-fits-all solution to water challenges worldwide, but rather a large diversity of situations within and across countries. Recognizing that governance is highly context-dependent is very important to fit water policies to places.

OECD has produced an analytical framework to diagnose major governance gaps in the water sector and to suggest a set of responses for overcoming them. The “Multi-level Governance Framework: Mind the Gaps, Bridge the Gaps” diagnoses 7 types of governance challenges that affect, to a greater or lesser extent, all countries, regardless of their institutional setting, water availability or degree of decentralisation. Such governance deficits are inherent to the intrinsic characteristics of the water sector (natural resource, fragmented, monopolistic, capital intensive, local and global etc.). This analytical framework was used to review water governance arrangements in 17 OECD countries (OECD 2011) and 13 Latin American countries (OECD 2012).

Earlier Chapters have stated ways in which the *governance* of water is a critical factor in the way it is financed and how reforms in governance are basic to improving its funding prospects. Good governance is the key both to attract the necessary finance, and to ensure the efficient use of these funds. The “Nexus” mindset highlights the

importance of improved coordination between water and other sectors (agriculture, energy, environment, land use, etc) and the promotion of synergies between them. Establishing procedures for stakeholder engagement is part of the process of “brokering” the level of water security that is desirable and “affordable” by societies, the policy trade-offs that need to be made, and the level of “residual risk” that different parts of society are left with after their governments have taken all feasible measures to protect them.

At a more concrete level, good governance is a precondition for choosing sound projects and ensuring they are efficiently implemented. In many countries, institutional dysfunction, corruption, and opaque decision-making contribute to the water crisis and undermine collective action. The lack of integrity and transparency affects the distribution of the costs and benefits of actions. Corruption not only distorts the choice of projects, but it also raises their cost and pre-empts part of the budget that should be going on construction and operation.

In recognition of the integral role of governance in all aspects of water development and, crucially, in approaches to its financing, the OECD suggests 12 principles for effective, efficient and inclusive water governance (Box 9). The 12 principles should be considered in a systemic way as they are mutually reinforcing, and engage all sections of society in their implementation.

- ▶ Governments should endorse the OECD’s principles of Water Governance and progressively implement these in their water development strategies. The Principles reinforce each other: progress on one will provide impetus for advances on others.
- ▶ In view of the heavy costs of corruption, falling on all parts of society and which discourage legitimate businesses, Governments are urged to engage with the Integrity Pacts in the Water Sector produced by the Water Integrity Network and Transparency International.

¹⁰⁰ OECD, 2011 « Water Governance in OECD Countries: a Multi-level Approach » OECD Publishing, Paris.

Box 9. OECD's Twelve Principles of Good Water Governance

Enhancing the effectiveness of water governance	1	allocate and distinguish <i>roles and responsibilities</i> for water policymaking, operational management and regulation, and foster coordination across these responsible authorities.
	2	manage water at the <i>appropriate spatial scale(s)</i> within integrated basin governance systems to reflect local conditions, and foster coordination among the different scales.
	3	encourage policy coherence through effective <i>cross-sectoral co-ordination</i> , especially between policies for water and the environment, health, energy, agriculture, industry and land use.
	4	adapt the level of <i>capacity</i> of responsible authorities to the complexity of water challenges to be met, and to the set of competencies required to carry out their duties.
Enhancing the efficiency of water governance	5	produce, update, and share timely, consistent, comparable and policy-relevant water and water-related <i>data and information</i> , and use it to guide, assess and improve water policy.
	6	ensure that governance arrangements help mobilise water finance and allocate <i>financial resources</i> in an efficient, transparent and timely manner.
	7	ensure that sound water management <i>regulatory frameworks</i> are effectively implemented and enforced in pursuit of the public interest.
Enhancing the trust and engagement of water governance	8	promote the adoption and implementation of <i>innovative water governance practices</i> across responsible authorities, levels of government and relevant stakeholders.
	9	mainstream <i>integrity and transparency</i> practices across water policies, water institutions and water governance frameworks for greater accountability and trust in decision-making.
	10	<i>engage with stakeholders</i> for informed and outcome-oriented contributions to water policy design and implementation.
	11	ensure that water governance frameworks foster <i>equity</i> across water users, rural and urban areas, and generations.
	12	conduct regular <i>monitoring and evaluation</i> of water policy and governance, share the results with the public, and make adjustments when needed.

Source: OECD (2015c). OECD Draft Water Governance Principles. Seen in draft

Regulation

For water services, regulation is a key part of a sound and credible public policy. International moves are afoot to develop principles of good regulatory practice, and disseminate these amongst national regulatory bodies.

OECD has established a Network of Economic Regulators (NER) to promote sound governance, including regulation of water.¹⁰¹ The first task of the NER was to develop Best-Practice Principles on the Governance of Regulators¹⁰² and to apply them to the water sector (OECD, 2015c).

The first International Water Regulators Forum was organised by IWA and ERSAR¹⁰³ in September 2014 in Lisbon, with the goal of promoting an informal worldwide network of water regulatory bodies, and convened 250 participants and 100 regulators from the five continents. This meeting led to the drafting of the Lisbon Charter

Box 10. The Lisbon Charter

The draft Lisbon Charter for Public Policy and Effective Regulation of Drinking Water Supply, Sanitation and Wastewater Management Services was at the core of discussions held at the 1st International Forum of Water Regulators, during the International Water Association World Water Congress. The Charter aims to inspire good practice for public policy and effective regulation in drinking water supply, sanitation and waste water management services, with clear reference to the rights and responsibilities of the various stakeholders and users. The draft version is now being further discussed with water stakeholders with the goal of having the approved document available for presentation at the World Water Forum in April 2015.

Draft provided by Jaime Melo Baptista, President of ERSAR, Dec. 2014

- ▶ Governments are recommended to take into account international instruments of good regulatory practice when reviewing their water policies and regulatory frameworks.

Governance and private engagement in water

Private companies provide water services of various kinds in a large number of countries, representing all shades of ideological opinion towards the involvement of private enterprise in public services. The beneficial engagement of private businesses does, however, depend on creating the right “enabling environment”. As part of its Water Governance Programme the OECD has conducted a Policy Dialogue in Jordan and Tunisia looking specifically at overcoming the challenges to PSP¹⁰⁴ in these countries

Box 11. Private Sector Participation in water in Jordan and Tunisia¹⁰⁵

In Tunisia there is limited use and knowledge of PSP in water, though Governmental interest in PSP is growing. Public administration is centralised and competent, but with limited capacity for PSP. Its major state enterprises involved in water services have a strong track record.

By contrast, in Jordan responsibilities for water and PSPs are scattered across a number of institutions, with some overlaps. Corporatisation of state bodies is underway. The country has varied experience with PSP on both large and small scale. It is on the verge of concluding mega projects and is at risk of failing to achieve their full benefits if the right conditions are not put in place.

Both countries have growing water stresses and have uncertainties and gaps in the legal and regulatory framework for both water and PSPs. Water operators are financially unsustainable without growing public subsidies. There is little accountability or stakeholder engagement.

The outcome of the policy dialogue in Jordan concentrated on the development of a sound framework of regulation. In Tunisia there was a greater focus on choosing the right types of PSP for particular purposes, e.g. small-scale PSPs for rural areas, piloting BOTs for water supply and wastewater treatment, and contracts giving incentives for technical and commercial efficiency.

101 <http://www.oecd.org/gov/regulatory-policy/ner.htm>

102 <http://www.oecd.org/gov/regulatory-policy/governance-of-regulators.htm>

103 The International Water Association and the *Entidade Reguladora dos Servicos de Aguas e Residuos* (Regulatory Body for Water and Wastewater of Portugal)

104 In this section the term PSP is used interchangeably with Public Private Partnership (PPP)

105 From OECD/GWP/Union for the Mediterranean, 2014

In both countries enhancing stakeholder engagement was given priority. Other common recommendations were for building up the capacity of the Project Management Unit, strengthening PSP capabilities in key areas of administration, developing National Financial Strategies for the water sector, and producing contingent liability reports for the budget to highlight the hidden fiscal liabilities from future commitments under PSP contracts.

Sources: OECD (2014), *Water Governance in Tunisia: Overcoming the Challenges to Private Sector Participation*, OECD Publishing, Paris, and OECD (2014), *Water Governance in Jordan: Overcoming the Challenges to Private Sector Participation*, OECD Publishing, Paris.

- ▶ Governments are urged to refer to the OECD’s Checklist for Public Action which aims to promote the creation of an “enabling environment” for private sector participation in water.

The role of private engagement

Public-Private Partnerships (PPPs) in water infrastructure are increasingly appreciated for the expertise they bring as much as, or even more than, for their direct contribution of “new” finance. This is one of the main messages from an authoritative study of the performance and impact of 65 large urban water utilities, representing 80% of water PPPs started before 2003 (Marin, 2009). One of its key conclusions is: “More and more countries are adopting a PPP model in which investment is largely funded by public money, with the private operator focussing on improving service and operational efficiency.” (*ibid.* P. 8).

This conclusion needs to be finessed. Insofar as they make water services more efficient and commercially-oriented, PPPs enhance the creditworthiness of their public partner and the latter’s ability to raise finance – and thus contribute indirectly to financing. It is also true that in a number of cases private partners have brought sizeable amounts of money to the deal (see below).

The greater use of PPPs in the procurement and implementation of infrastructure does not reduce the

administrative load on public sector clients, but rather imposes additional challenges if there is to be maximum public gain. This also applies to regulators, which need to upgrade their capacities to manage new types of contract and counterparts.

A Report by the Panel on PPPs (“P3s” in US terminology) of the US House Committee on Transportation and Infrastructure comes to a broadly convergent view:

*“P3 procurements have the potential to deliver certain high-cost, technically complex projects more quickly or in a different manner than would otherwise occur under traditional procurement and financing mechanisms...” However, the authors point out, “P3s are not a source of funding and should not be thought of as the solution to overall infrastructure funding challenges”.*¹⁰⁶

In the USA the ready availability of cheap public funding through municipal bonds and state revolving funds, as well as federal grants, has discouraged the spread of P3s so far, though the situation is fluid.

PPPs have so far made little progress in large public irrigation schemes. This may be changing. AsDB is providing a sovereign loan of \$46 million to Bangladesh for the modernisation of the Muhuri Irrigation Project in Chittagong Division. This includes a 5-year performance-based management contract with a private operator. It is envisaged that this will lead to a full PPP contract of 15 years.¹⁰⁷

The two aforementioned studies take a pragmatic view of PPPs and provide a better understanding of what PPPs can and cannot do, in comparison with the public sector alternative.¹⁰⁸ In this spirit, it is recommended:

- ▶ Governments and water authorities considering public-private partnerships in their water sector should focus on evidence of the *actual or likely performance* of PPPs, including their value-for-money, impact on tariff levels, affordability, and quality of services to poor consumers and those previously unserved.

¹⁰⁶ Executive Summary of *Public Private Partnerships: balancing the needs of the public and private sectors to finance the nation’s infrastructure*. Report of the Panel on PPPs of the House Committee on Transportation and Infrastructure, 2014. It should be pointed out that there are exceptions to this view, where private partners have brought sizeable amounts of money to the deal, e.g. in Rialto, California, and Bayonne, New Jersey.

¹⁰⁷ ADB Proposed Loan: *People’s Republic of Bangladesh: Irrigation Management Improvement Project*. June 2014

¹⁰⁸ E.g. the “public sector comparator” as used in the UK’s Private Finance Initiative.

- ▶ In setting the policy framework for PPPs Governments should be aware of the potential contribution of PPPs to all levels of the value chain, including investment by small-scale business.¹⁰⁹
- ▶ Governments should consider ways of combining PPP with targeted social support where tariff affordability amongst the poor remains a challenge (See Box 12)
- ▶ Public sector clients should consider making more use of DBOTs to access private expertise in the earliest stages of designing projects.
- ▶ In soliciting Expressions of Interest and drawing up shortlists of bidders, public clients should recognise and engage with the new “water entrepreneurs”, e.g. construction companies, and companies from Brazil, China, Singapore, India and the Philippines, amongst other new water players. These newer players can bring different approaches and business models that may add value.

Box 12. PPP and public subsidy combined in Nagpur

The PPP in the Indian city of Nagpur combines a 25-year management and operating contract with a private consortium (rewarded by a fixed fee per unit of water distributed) with a 70% subsidy from Central Government and State of Maharashtra for the initial 5-year CAPEX programme. This project, and a few others of a similar nature, aims to use PPPs to start tackling the gross inefficiency of India’s urban water systems, while mollifying the traditional political and public hostility to private engagement with water services through the use of subsidies to restrain tariff increases.

Source: Kacker, et. al, 2014

MAKE BEST USE OF MARKETS, COMPETITION AND INNOVATION

Local monopolies (public or private) are heavily involved in management and service provision at all stages of the water cycle. However, there is much to be gained from enlisting market forces to stimulate the changes vital to deal with future water challenges. This entails competition between incumbents and new entrants, innovation in technologies, products and service delivery, and the co-existence of existing and new business models, with their own financing solutions.

“Smartness” in water, and Disruptive Technologies

Numerous studies indicate the scope for the spread of “smart” water systems, defined as “systems, components and software that allow the user to monitor, manage and act on data relating to the part of the water cycle that is pertinent to their interests” (Lloyd Owen, quoted in OECD 2015a). Smart water systems would incorporate “smart” meters, that enable “remote accessibility of consumption data which improves meter reading and billing, detection of leaks, illegal connections and tamper alerts, as well as enhancing the determination of peak demand” (OECD, 2015a).

Smartness also extends to water quality: a “smart” system provides different qualities of water to different types of user, saving the cost of treatment to a high standard where this is not required by the user. Providing these smart systems is easier where networks are being constructed *de novo* – since it can be expensive to modify existing systems. “Smartness also applies to tariffs that remove the disincentive facing water companies under regulatory pressure to reduce consumption by their customers, by partially de-coupling their revenues from their sales volume (*ibid*, pp 43-46).

Water is ripe for the arrival of “disruptive” technologies allied with new business models, both of which challenge incumbent utilities (typically local monopolies) with centralised systems of water distribution, sewerage and wastewater treatment. Some of these are reviewed below.

¹⁰⁹ The World Bank’s publication “Tapping the markets”, 2014 has large menu of possible actions

- ▶ All service providers should intensify their search for and application of “smart” solutions for their service delivery.

Promoting research & development (R&D) for water infrastructure, technology and services

It is sometimes said that water is not “rocket science”. But it could be, if science, ingenuity and new players were given scope. As an illustration of this, the *Financial Times*¹¹⁰ presented six possible technological solutions to help relieve water scarcity: Making Water from Air, Shipping Water, Waterless fracking, the Waterless Toilet, the Almost Waterless Washing Machine, and Smart Irrigation.

It is hard to predict which, if any, of the above “solutions” will become feasible and widely adopted but it is important to create the conditions in which such innovation can flourish, and in which market success determines the outcome. Governments cannot be expected to predict successful future technologies and may distort the path of innovation by well-meaning, but eventually misguided, attempts to “pick the winners”.¹¹¹

- ▶ Governments, philanthropic funds and businesses (including the latter’s CSR programmes) are urged to promote adequate funding for R&D and innovation in water, using research grants, challenge funds, prizes, support of pilot ventures, venture capital, and other means.
- ▶ In order to ensure that research, piloting and implementation of innovative water solutions were adequately rewarded, Governments should move towards creating an “enabling environment” where water received its proper valuation in economic and financial terms.

Encouraging new business models

Institutional innovation in water is urgently needed. Discussions about the development of water services are still typically framed by a “public utility monopoly”

mindset. This is increasingly unsustainable and unfeasible in many regions of the world. Many public water providers lack financial resources (indeed, many are financially bankrupt and rely on public subsidies). Most struggle to keep up with the growing demand for their services from exploding populations, and from more exacting demands from users.

There is both need and scope for new business models, with their own financing systems. This is illustrated below in the contexts of both networked and non-networked water services.

Networked services outside the utility monopoly.

In some countries private companies are allowed to create and operate networked services for water supply, subject to public regulation and licence. There is growing experience with various types of this model and, from a pragmatic viewpoint, some seem more promising than others (a point made in a recent World Bank study of Cambodia, Bangladesh and Benin.¹¹²)

Non-networked services.

In urban slum areas and peri-urban populations it is not always feasible to provide connections to networked water services (with or without meters) to every household, nor connections to sewerage for the disposal of wastewater. In practice, a variety of informal (private, NGO or community-based) systems arise to fill the vacuum caused by the absence or failure of the “monopoly” utility. Some of these feed off the bulk supplies provided by the utility – indeed, Manila Water itself provides metered bulk water for distribution through local networks in poorer communities through its successful *Tubig para sa Barangay* programme.¹¹³ In other cases informal operators work, sometimes “below the radar” or in other cases hamstrung by inappropriate laws or regulations.

In the case of household sanitation, there are many more possible business models, involving private enterprise at various entry points in the service supply chain (*Sy et.al* 2014).

¹¹⁰ Pilita Clark, “Six solutions to a shortage”, *FT* 9 Dec 2014, p. 13.

¹¹¹ There is an analogy with energy, where the case for abolishing subsidies for renewables and using the savings to sponsor research and development is made by Prof Dieter Helm, *FT*, 21 Oct 2014, p. 15.

¹¹² *Sy et.al.* 2014

¹¹³ Rivera (2014)

- ▶ In order to harness and promote new business models in both networked and non-networked service provision, the first step is recognition by authorities that informal provision is going on. The second step is to provide a suitable “enabling environment” in which properly-regulated operators can carry out their business.

Once this is done, the supply of local financing for these services will be much easier and cheaper.

A different solution is the *social business model* combining commercial and social aims. In Bangladesh Grameen Veolia Water Ltd is a “no loss, no dividend” venture aiming to provide safe drinking water to rural households, schools and health centres at affordable tariffs, with any profits reinvested in infrastructure. The project involves the use of state of the art technology to treat surface water (thereby avoiding the dangers of arsenic poisoning from groundwater) and bottle it in 5 gallon jars for distribution and sale in Dhaka.¹¹⁴

Another business model with some promise is the *Alliance Contract* variant of the traditional PPP. This is a cooperative model which aims to create a better alignment of objectives between contractual parties. In South Australia this takes the form of a 10-year O&M Alliance Contract between the Allwater Joint Venture (Transfield Services, Suez Environnement and Degremont) and the South Australian publicly-owned water utility. The contract offers integrated governance and team, joint responsibility for delivering works against defined performance targets, and risk sharing according to the degree of control and accountability of the parties involved. The keynotes of the alliance are cooperation and collaboration,, transparency, joint responsibility and creation of a common culture.¹¹⁵

wastewater treatment as a form of value recovery

Until recently, wastewater was regarded as a potentially hazardous and unpleasant substance to be treated to a level that enabled it to be safely disposed of into the natural environment. Times are changing. Wastewater is now seen as a potentially valuable resource which,

properly treated and managed, can be a source of water for re-use, as a source of nutrients for agriculture, and as a source of biogas and heat.

These properties are transforming the financial prospects for wastewater treatment plants. Instead of being regarded as financial liabilities, unable to recover their costs except through surcharges on fresh water supply or through subsidies, WWTPs can now look to new markets for their treated water, gases and heat (Box 13.)

- ▶ Utilities should examine the potential of wastewater treatment as a profitable business opportunity through the sale of treated water for re-use and the sale of heat and power generated in the treatment process.

Box 13. Denmark’s wastewater treatment plants become power generators

Danish WWTPs are starting to generate electricity from biogas, and selling it back into the national power grid. There is also potential for using heat produced in the treatment process to supply local homes and businesses. The process uses proven technology, there is a firm market for the power produced, and the projects are profitable and self-financing.

At a global scale, WWTPs could become major net energy producers, rather than big net power consumers.

In Denmark WWTPs are part of public commercialised entities having a statutory aim of using any financial surpluses to reduce water tariffs (the highest in the world). In other statutory regimes, the process of using biogas to generate power for sale could attract profit-seeking companies.

Source: presentation by Mikkel Hall, Danish Water and Power Regulator, at OECD Global Forum on Environment, Nov 27, 2014

¹¹⁴ Described in a presentation on Goalhari, Bangladesh, by Valerie Jadot (Veolia) at a workshop on “Water and sustainable development: from vision to action”, Zaragoza, Spain, 15-17 January, 2015.

¹¹⁵ Described in material provided to the HLP by Suez Environnement

Pooling water systems of small and medium sized cities to obtain economies of scale

Water functions and services are best provided at different scales depending on whether they are for water supply, wastewater collection, waste water treatment, urban drainage, protection against floods, protection against scarcity, etc.

With the above qualification, combining key functions of smaller towns and cities into common organisations can create economies of scale and agglomeration which yield efficiencies. Certain functions which are not feasible to perform at a smaller scale of operation become viable at larger scales. Box 14 illustrates an initiative of this kind in Colombia.

Box 14. Pooling resources for small and medium sized towns and cities in Colombia

CAF is assisting the Government of Colombia in designing and implementing a national program to scale up water and sanitation investments in small and medium utilities, while providing technical and managerial support through ad-hoc departmental companies and with participation of the best utilities of the country. The financing of investments and technical assistance is made up from contributions of the national governments, financed by CAF; from municipal resources from their own fiscal allocation and earmarked royalties from the mining and oil sectors; and, from allocations of regional and autonomous environmental corporations which raise substantial revenue through property taxes and from charging and collecting a wastewater pollution fee.

Resources are pooled into a specific fiduciary fund, managed by a financial institution, which is selected competitively. Technical and management assistance is provided through twinning arrangements which are also subject to a national bid with participation of some of the best performing utilities of the country and internationally. The model provides incentives to consolidate small utilities into larger regional enterprises following the logic of managing water resources and water services by river basins.

Source: memorandum from CAF to the HLP

- ▶ National ministries for water and local government should assess the scope for pooling the resources of small and medium sized cities in order to achieve the efficiencies that go with economies of scale.

Another instance of the benefits of aggregating a number of smaller sub-projects in order to create economies of scale is described in Box 15.

Box 15. China: the Rural Smart Wastewater Treatment Project

ADB is providing a dual currency (dollars and yuan) loan of \$100 million from its own resources, associated with a B Loan of \$200 million for the Rural Smart Wastewater Treatment Project in the People’s Republic of China. The loans are being made to Sound Global Ltd and its subsidiary Beijing Sound Environmental Engineering Co Ltd, both private companies, without a government guarantee.

The project consists of the design, construction, operation and maintenance of multiple wastewater treatment sub-projects using the small multiple modular automatic rapid technologies (SMART) solution with a capacity of up to 240,000 tons/day and associated trunk sewage pipeline networks. Each sub-project will have a “mother” plant controlling multiple “daughter” plants. The project company will have BOT concession agreements with county and/or municipal governments, and will bear completion and operating risk.

The SMART solution is based on the rotating biological contactor technology used in the USA and Europe. It is well suited to rural wastewater treatment needs, combining multiple small-scale standardised modular plants with a centralised control system. Wastewater tariffs will be bundled in with water tariffs, and backstopped by the host city or county governments.

Commercial finance is rare in China for this kind of rural environmental infrastructure. The project’s “portfolio” approach is designed to “bulk up” small individual schemes to a size in which transactions costs are feasible.

Source: ADB “Proposed Loan: Sound Global Ltd and Beijing Sound Environmental Engineering Co Ltd. Rural Smart Wastewater Treatment Project. (PRC). June 2014.

The case in Box 15 illustrates several other points made in this Report, namely: the important role of an IFI in providing comfort to commercial lenders through the B Loan system in order to promote a local capital market for this sector, its encouragement of private involvement in this novel technology and business model, and the inclusion of both forex and local currency in the lending package.

PROMOTE GREATER EFFICIENCY IN WATER INVESTMENT AND MANAGEMENT

There is a common perception, based on much factual evidence, that many water systems are inefficient and do not generate enough cash flow to cover essential expenditure, nor provide the basis for attracting repayable finance for new investment.

McKinsey (2013) provided some indications of the scale of the savings (\$1 trillion annually in total) that could be expected from greater efficiencies in the operation of global infrastructure. For water, it was estimated that reducing technical (i.e. physical) water losses would cost less than 3% of the capital outlay necessary to provide the same volume of water from scratch and would save \$1.35 trillion in new investment over 18 years.

As part of the same study, a survey of 22 countries at different levels of development revealed that Non-Revenue Water (comprising leaks, illegal diversions, and water not billed) averaged 34%, and up to 70% in the most extreme case (Nigeria). Using various methods (e.g. optimising storage and scheduling) it was estimated that water operators could reduce peak consumption by 5-7.5% in developed economies and 10-15% in developing countries. This could save 4-6% in the need for global capital investment. Various methods of demand management indicate a potential for reducing consumption by 15-40%, yielding potential savings in capital investment of 14-29%. (*ibid.* P. 81).

This section makes a number of proposals for making water more efficient, and for improving its cash flows. They cover increasing tariff revenues, proving O&M

funding in loan packages, life-cycle approaches to costing & opex/capex coupling, optimising maintenance, using Results-Based Finance and Performance-Based Contracts, and choice of Green Infrastructure. All of these would make water Fitter To Finance.

The adequate provision of funds for O&M is essential to optimising the efficiency of water infrastructure. A failure to properly fund recurrent costs of infrastructure will result in disappointing services delivered by those assets and the commitment of future capital spending to rehabilitation, rather than increased capacity. The problem is aggravated where the demand for water has fallen due to structural and demographic changes, or as a result of water conservation measures.

Inadequate O&M funding arises not only in water supply and sanitation, but also in dams and other kinds of infrastructure. The World Bank was recently approached to finance the rehabilitation of the Ruzizi II hydropower plant owned by Rwanda, Burundi and the DR Congo. After less than 15 years of operation the project is in need of major rehabilitation, due in large part to the neglect of maintenance and sub-optimal operation. (van Ginneken, 2014).

Increasing revenues from tariffs

Uneconomically low tariffs, which reduce cash flows for efficient O&M as well as capital investment¹¹⁶, have been identified as the basic problem of water in virtually every serious published analysis of water supply, sanitation and irrigation. However, progress in addressing this problem has been slow due to the reluctance of local and central governments to charge full tariffs, and opposition from consumers with connections to subsidised services, as opposed to those outside any public networks.

There are some well-publicised cases of successful tariff reforms (Uganda, Pnomh Penh, etc) but they are well publicised precisely because of their rarity. Water tariffs remain an intractable problem in many cases and concerns, however legitimate, about their “affordability” is a block on tariff reform.

- ▶ It is vital to continue to insist on the importance of setting economic tariffs as the bedrock of sustainable

¹¹⁶ As well as failing to signal the value of water in water-scarce situations, thus allowing waste to continue

water financing since they are the only feasible source of sustainable finance for the recurrent costs of O&M.

Many water users will complain that it is not fair to charge more for a poor service. They have a point, and there is much to be said for approaching the aim of raising revenues through addressing *collections*, in the first instance. In most water distribution systems the rate of collection is below 100%, and in some case greatly below this figure¹¹⁷. This can be due to several causes: bribery of meter readers, manipulation of meters, illegal connections, delays and inefficiency in billing, and - in the case of other public utilities - bartering of services in return for non-payment of tariffs.

- ▶ Concentrating on an increased rate of collection – which does not involve any change in the tariff – can set off a virtuous circle of improved revenues, better attention to repairs and quality of service, leading to more receptivity to eventual tariff reforms as and when these are required.
- ▶ Pre-payment for services is another option – as used for water in some Chinese cities, and for the use of (privately funded) toilets in some Indian informal settlements.

“Affordability” of tariffs is often used as a reason not to raise them. Some water regulators incorporate affordability as an explicit criterion. In Sao Paulo state in Brazil service providers are required to set a special low tariff for households at or below the official poverty line. This entails cross-subsidy from other customers which, carried to excess, can generate distortions and which are, in any case, not transparent for public debate. The same objection could be made to cross subsidising water from other services, such as the practice in Casablanca of using energy tariffs to cross subsidise water and sewerage services. Within reason, this may be a pragmatic solution for dealing with differences in consumers’ willingness-to-pay for the different services, but carried to excess it can distort the relative demand for the services in question.

The option preferred by economists for dealing with affordability for poor consumers is to make direct transfers to them through a social security system.

However, the latter is only feasible in countries with well- developed social security payment systems (Chile and Macao are examples).

- ▶ Regulators should take account of the *affordability* of tariffs as a criterion in their oversight of water providers, after covering essential O&M and maintenance of the quality of service.
- ▶ Where feasible, Governments should deal with affordability by making direct transfers to the target group of consumers .

There are some striking cases where the problem of affordability is overcome by a combination of subsidised connection programmes, intensive capacity building in the service provider and efficiencies provided by a PPP containing specific performance indicators (See Box 16)

The case study in Box 16 illustrates several of the key messages of this Report: the importance of capacity building and motivation in water service providers; the feasibility of turning service providers into efficient and customer-oriented businesses with a strong social purpose; and the possibility of charging cost-recovering tariffs that are also affordable, even in the poorest communities. One of the key factors in the success of this case was the spread of subsidised household connections. Although in this case it was done through the company’s Corporate Social Responsibility Programme, in other cases it has been done using ODA or NGO grants. This is now widely recognised as one of the most effective uses of subsidies, since it increases the service network and adds to the critical mass and viability of water distribution systems.

- ▶ Through CSR programmes private companies can make a critical difference to local water and sanitation services through training and capacity building, and the use of subsidies to expand the network of connections.
- ▶ Subsidising connection programmes is a more efficient and sustainable way of promoting the spread of watsan in poor communities than subsidising tariffs.

¹¹⁷ In the two Indian cities for which data were available in Kacker et.al. (2014) the collection rates were 50% (Khandwa) and 73% (Nagpur).

Box 16. Affordable social connections for water in Niger

Niger is one of the world's poorest countries. As part of its policy to meet the water MDG it aims to reach 75% of the urban population through private connections or public standpipes. Water infrastructure is owned by the public asset holding company *Societe de Patrimoine des Eaux du Niger* (SPEN), which has sub-contracted the operation of the network to *Societe d'Exploitation des Eaux du Niger* (SEEN), a subsidiary of the French private water operator Veolia. SEEN operates under an *affermage* contract, including performance indicators.

SEEN has increased the number of private connections three-fold, by 1 15,000, of which 58,000 are social connections, in addition to 530 new standpipes. The connections are wholly subsidised by the company. For the social connections, provided to households below the poverty line, water is charged at around half the price of supplies from vendors or standpipes. Altogether, 1.5 million people have been given access to water under this programme, raising the proportion of urban dwellers with access to residential connections to almost 60%. Over a three-year period, Veolia and SEEN trained all 550 of SEEN's employees into their roles, including becoming "hygiene ambassadors" in the communities they serve.

Following the programme, water is provided on a continuous basis in most urban areas of Niamey, the capital city, at a quality 98% compliant with microbiological standards. Non-revenue water has fallen from 22% to 17%, and the bill collection ratio has increased from 91% to 97%. Staff productivity has improved from 8.6 to 3.6 staff per 1000 connections.

SEEN no longer relies on government subsidies – it recovers its O&M costs from sales revenues, is able to service its debt, and contributes to CAPEX.

Source: Case study on Niger presented by Akine Atta of SEEN, at a workshop on "Water and sustainable development: from vision to action", Zaragoza, Spain, 15-17 January, 2015.

Including funding for O&M in loan packages

The issue of whether or not to include funding of the recurrent costs of projects has often been debated in development agencies and banks. On the one hand, a failure to provide such funding often means the premature obsolescence and failure of projects due to the neglect of essential maintenance. On the other hand, the external provision of such funding removes an incentive for the host organisation to create cost recovery and budgetary systems essential for the long term sustainability of the project.

While recognising that there is a real dilemma here, a pragmatic approach may be valuable in some cases. The CAF's Programme for wastewater treatment and pollution control in Panama City includes O&M costs for 4-5 years in the financing package. The purpose of this is to buy time for the public utility to develop technical and managerial skills, and address systemic issues, necessary to create a sustainable financing basis for the operation.¹¹⁸

- ▶ Financing institutions and donor agencies should take a pragmatic view on including funding for O&M in their financing packages.

Life cycle approaches to costing, financing and capex/opex coupling

Levels of operating costs (opex) should be projected over the full life of assets, and in conjunction with the planning of capital spending (capex). A failure to consider, and provide for, opex and capex together will result in sub-optimal performance of services, eventually leading to higher recurrent costs and difficulties in attracting suitable finance.

Without the proper provision of O&M funding, in the words of one leading international operator "...numerous examples over a wide range of countries demonstrate that the decay of the investments is quick and entails huge amounts of money to be reinvested to stabilise the situation?"¹¹⁹ The Management Contract between the Algerian Government and *Suez Environnement* for the Wilaya of Algiers illustrates how this can be dealt with. With assets remaining 100% in public ownership, the managing entity SEAAL has drawn up a business plan with secured financing for all CAPEX and OPEX anticipated

¹¹⁸ Memo for the HLP from CAF

¹¹⁹ Memo for HLP from Veolia

for the duration of the contract(s).¹²⁰

- ▶ Operators of water infrastructure should project levels of operating costs (opex) over the full life of their assets, in conjunction with the planning of capital spending (capex), in order to optimise costs and financing needs over the lifetime of the asset. This is becoming common practice in large projects involving private water companies, and should be emulated for all water infrastructure.

Optimising maintenance

Neglecting routine maintenance, and recurrent replacements of parts, is a major cause of the malfunctioning of water systems which causes distress to users and premature obsolescence of the installations. In the long run it raises the cost of water infrastructure.

The costs of maintenance can be minimised by *data-enabled* systems (Box 17) and by targeted, risk-based maintenance. This enables a provider’s maintenance budget to be employed most effectively, and minimises users’ aggravation due to bursts, leakages, outages, reduced pressure, contamination and other common problems.

Box 17. “Data enabled” maintenance saves costs

In the USA the Massachusetts Water Resources Authority has developed a predictive maintenance strategy based on monitoring the condition of each component and the probability and consequences of its failure. The programme increased equipment availability to 99%, and achieved cost savings by eliminating unneeded and low-value preventive maintenance work and shifting the freed-up resources to predictive tasks and actual maintenance work.

In the UK, an advanced pressure management system with software, sensors and controllers is used to detect leakages at an early stage, and has reduced water loss by 1.5 million litres per day .

From information made available to HLP by WEF

- ▶ Owners of water infrastructure and water service operators should consider the introduction of optimal maintenance procedures to minimise O&M costs and make best use of limited maintenance budgets.

Results-Based Finance (RBF)

RBF¹²¹ is a method of payment for infrastructure whereby disbursement is only made once the installation is complete and has started operation. The motive of RBF is to give contractors a strong incentive to optimise project design and implementation, and to minimise delays before the project is up and running.

The PRODES programme in Brazil illustrates the operation of an RBF scheme at national (federal) level to accelerate the spread of municipal wastewater treatment (See Box 18).

RBF is being piloted in a number of other contexts – water demand management in Sao Paulo state, increasing household sewerage connections in Uruguay, increasing access to water supply by poor households in Manila and to water and sanitation in Morocco, irrigation performance in North China, and arresting deforestation in Costa Rica (Rodriguez et. al. 2014).

In the context of development cooperation Output-Based Aid is a variant of RBF, with a growing number of applications in water supply, household sanitation and wastewater collection and treatment (Tremolet, 2011, Winpenny, 2013). OBA has also been used with the express purpose of encouraging local banks to enter the water financing market (Mehta & Virgee, 2007).

- ▶ Results-Based Financing deserves to be used more widely by governments, banks and other financing agencies as a means of instilling more efficient design, procurement and implementation of investments in water infrastructure.

Performance-Based Contracts (PBCs)

PBCs have the same intent as RBFs, but normally apply to on-going services provided by contractors, rather than capital investment. PBCs are becoming widely used by utilities, irrigation authorities and other clients as the basis for engaging private contractors to manage and

¹²⁰ Memo for HLP from Suez Environnement

¹²¹ In the context of contracts for management and operation of existing assets, RBF is more commonly known as Performance-Based Contracting, though RBF and PBC have similar aims.

operate water services. In all cases, the fee awarded to contractors is based on their performance against certain pre-agreed criteria.

- ▶ Public clients should make full use of Performance-Based Contracts in their engagement of private sub-contractors in order to maximise the efficient operation of infrastructure and supply of services.¹²²

Green Infrastructure as an option

In certain cases, it has been shown to be cost-effective for cities to rely on “green” solutions in preference to investment in conventional (“grey”) water management processes. Apart from having a lower environmental impact and being cheaper, these solutions often have a lower recurrent cost. In one such case in Cromer, UK, alternative methods were compared to mitigate flood risks resulting from the expansion of impervious surfaces. A technically feasible and economically preferred option would be to retrofit sustainable drainage systems (SuDS) involving the disconnection of large individual properties from the storm sewer, using SuDS devices to deal with their storm drainage instead. This approach would also transfer some of the cost away from the sewerage provider and onto local developers (cited in OECD 2015a).

A project sponsored by The Nature Conservancy examined the cost-effectiveness of using watershed conservation as part of the solution for maintaining the quality of urban water worldwide. The measures tested are forest protection, reforestation, the use of Best Management Practices in agriculture, riparian restoration and control of forest wildfires.

The abovementioned research shows that one or more of these five strategies could have a major beneficial effect on sedimentation or nutrient pollution affecting 700 million people in 100 of the world’s largest cities. The management of agriculture would have the greatest impact. If all possible conservation strategies were applied, global savings in water treatment costs of \$890 million annually could be achieved. One in four of the 534 cities in the research could expect a positive return on investment for such conservation (TNC, 2014).

Box 18. The PRODES programme in Brazil

Since 2001 the National Water Agency (ANA) has managed the PRODES scheme under which the federal government subsidises water utilities for investment in wastewater treatment plants. Payments are linked to certified outputs of the WWTPs, i.e. the volume of effluent from the plants treated to minimum norms. Up to half the investment costs can be reimbursed over 3 to 7 years, conditional on the outputs of these plants. The programme has the aim of stimulating new investment in WWTPs and ensuring sustainable operation and maintenance of the plants. Construction, completion and operational risk is borne by the service provider, and the Government is relieved of the risk of subsidising badly implemented projects.

ANA would deposit the capitalised value of the future flow of subsidies into a special account in the public bank Caixa Economica in the name of the service provider. This removed any “government risk” from the payments. ANA would monitor the performance of each plant on a monthly basis according to pre-agreed criteria, and the subsidy payment would be made if the outcome was satisfactory – otherwise the payment would be returned to Government.

This pilot programme was introduced in response to decades of ineffective subsidies paid directly to sewerage companies who were more focussed on constructing new facilities (often of a grandiloquent nature) than on producing treated sewage.

Over the period 2001–2007 PRODES made subsidy commitments of US\$94 million, leveraging total investments estimated at US\$290 mn. , financing 41 WWTPs in 32 cities¹²³. Geographically, projects have been concentrated in the SE of Brazil, where urbanisation is greatest and pollution most serious. Despite these positive results, PRODES has remained a pilot programme. Many service providers experienced problems due either to sewage collection or the treatment process itself, which led to renegotiation with ANA and in some cases a reduction of the subsidy payments. Also, some utilities prefer to use traditional means of finance through public and private banks, without the delays and financing risks posed by the use of PRODES funding.

Source: memo for HLP from Prof Jerson Kelman

¹²² Cases of PBCs include Algiers, Adelaide and New Delhi. The OECD has documented other references in Eastern Europe, the Caucasus and Central Asia. (OECD 2011a)

¹²³ Figures from Wikipedia

OFFER FINANCIERS A BETTER BALANCE OF RISK AND REWARD

Financiers judge a proposition according to whether it offers an acceptable balance of risk and reward. Different types of financiers have different criteria for this, depending on their business models and *risk appetite*. Sponsors of water projects and corporate businesses in this sector need to work on both sides of the risk-reward calculation, and in their approach to financiers make a proposition that appeals to the latter's risk appetite.

The *reward* from water needs to be boosted through a larger cash flow from both increased revenues and more efficient operations. On the revenue side the Report proposes "smarter" use of tariffs linked with targeted social measures to cover affordability concerns, improved collection of bills due, seeking new business opportunities through added-value services to consumers and profitable use of waste products and processes, amongst other actions.

To minimise *risk*, a rational allocation of risks with partners is proposed. This should be based on the risk profile of partners (how much risk they are willing and able to take, and their options for managing these risks). Appropriate use should be made of financial risk mitigation devices such as guarantees. There should be adequate equity (at project or corporate level) to absorb risks and uncertainty remaining after all feasible measures have been taken to share and mitigate risks. In financial terms the aim of risk management is to minimise the cost of finance (the *weighted average cost of capital - WACC*) for each project or business model.

Sharing risks

The conventional approach to the division of risks between parties to a contract is based on the principle that the party with most control over the risk concerned, and who is best placed to handle it efficiently, should bear that risk. This Report proposes a modification of this principle, to reflect the *risk profile* of partners. Specifically, this would take into account how much risk they were *willing* to take, and their *ability* to take such risk, including their *options for managing* it. This will determine the structure of the financing deal.

In some cases, documented specifically in the hydropower sector (Head 2000 and 2004) certain risks have been passed inappropriately onto the private contractor. This is not in the best interests of the public sponsor/client, since it raises the cost of finance raised by the private partner, which gets reflected in the bid price, and the risk may ultimately gravitate back (*leak*) to the public sector client. In cases where risks are difficult if not impossible for private partners to manage (e.g. the geological and seismic risk of dams, or the hydrological risk for dams, irrigation schemes or bulk supply of water to urban distribution networks) there is little alternative to governments backstopping the deals¹²⁴

- ▶ The allocation of risk between the various parties to a contract should follow the principle that specific risks should be allocated to partners according to their risk appetite and their willingness and ability to shoulder and manage the risks concerned.

Using risk-mitigation products

There are various ways of mitigating risks such as financial guarantees, insurance, "umbrellas of comfort", escrow accounts, interest linked to performance or other measures, etc. These normally come at a cost. Foreign exchange risk is of particular concern to sponsors of water projects and the only feasible way of managing this is through maximum use of debt or equity denominated in their local currency.

- ▶ IFIs and donor agencies with the means to do so should expand their use of local currency financing for water infrastructure and use their range of products to support the growth of local capital markets for this purpose (e.g. in Poland and Russia the EBRD raises funds in local currency and makes loans denominated in these local currencies.)
- ▶ IFIs and other agencies offering risk mitigation products should review the use and uptake of these products and consider taking the following measures:
 - ▷ Reconsider their current policy of full capital provisioning for guarantees, the same as for loans, despite their nature as a contingent liability, which is arguably an excessive limit to the use of guarantees.

¹²⁴ In the San Roque project in Philippines and the Guerdane irrigation project in Morocco, Governments have accepted hydrological risk rather than leave it with their private partners. Some private water supply concessions have experienced difficulties due to the unreliability or contamination of their bulk water sources.

- ▷ Emulate IBRD and IDA, which as from July 2014 have fully mainstreamed the use of guarantees into their regular financing processes, “reducing restrictions and perceived gaps under the stand-alone guarantee policy”. (World Bank 2013, p. 2, quoted in Humphrey *et.al.* [2014]).
- ▷ Target the use of guarantees to areas where they are likely to have maximum impact. One opinion is that: “...the most useful situation for partially guaranteed bond issues is in developing domestic capital markets, where the strength of the [IFI] rating can have greater impact and the investor base find the resulting product quite attractive”. (Humphrey & Prizzon (2014), p. 26).

In this context, there is growing interest, especially in Africa, for the creation of a new guarantee facility focussing only on water.¹²⁵

- ▶ Donor agencies, IFIs and other international agencies should consider and report on the need for, and feasibility of, a new guarantee facility dedicated to water, which might be specific to a region.

Role of equity

Equity holders ultimately absorb risk remaining after all management and mitigating efforts have been done. Private investors would be willing to assume this risk if there were sufficient prospect of “upside” in the project. If not, there may be justification for the public authorities to take an equity stake if there were overriding “public interest” in this. This would apply to major projects of a strategic nature, including some multi-purpose schemes. The amount of equity required in a project will depend on the nature of the project and the residual risk it entails. Too much equity can be a cost (since investors will require a market-related rate of return, normally higher than the cost of debt), but too little equity will be a source of risk, raising the overall cost of the financing package.

- ▶ Sponsors should ensure that the capital structure of a project or Special Purpose Vehicle contains a balance of debt and equity appropriate to the risks entailed in that project. Public authorities should be prepared to invest in equity if there is sufficient public interest in the project.

¹²⁵ Reported in the consultation with AfDB.

IMPROVE THE USE OF EXISTING FINANCING SOURCES & SECURE ACCESS TO THE NEW ONES

I) GETTING MORE FROM EXISTING SOURCES OF FINANCE

A number of existing sources of water finance report that they would be able to respond positively to increasing demand for their services. Some lending and donor agencies have struggled to fill their targets for water. It is also reported that in a number of developing countries water budgets are routinely underspent. Anecdotal evidence strongly points to spare capacity in existing sources.

This section makes proposals for tapping existing sources more fully through a combination of : increasing bankable projects; making IFI balance sheets go further; and making more use of blending.

Increasing the flow of “bankable” water projects through pre-project support

The shortage of “bankable” water projects is a near-universal complaint of banks, IFIs, institutional investors and other potential water financing institutions. On a positive note, institutions that have the means to provide pre-project support can develop project pipelines for themselves and their partners, thus leveraging their initial outlays.

It is easy to overlook or under-estimate the costs of identifying, appraising, preparing and tendering a project up to the point where a serious approach to financiers can be made. Typical costs for these pre-construction stages, as a % of investment costs, are:

Projects costing less than \$100 million:	3-4%
Projects costing \$100-500 million	2-3%
Projects costing more than \$500 million	2%

These estimates exclude the costs of acquiring land, early works and environmental impact assessments (World Bank/ICA/PPIAF 2009)

There are numerous funds and facilities available to cover these costs; a recent guide produced by the ICA listed over 20 for Africa, with guidance on the procedures for approaching each of these. (ICA, 2006). There is anecdotal evidence that a number of these funds are under-used, possibly because of over-elaborate conditions and procedure attaching to their use, or because some of them are not linked to potential funding sources. Whatever the reasons, in Africa at least, it is preferable to make existing pre-project support facilities more useful and user-friendly, before turning to the creation of new ones.

The African Water Facility housed in the AfDB and the EU’s Water Facility exist to support a range of capacity building functions, including upstream work on projects. Other facilities have been created covering all types of infrastructure, such as the World Bank’s new Global Infrastructure Finance Facility

Alternatively, the public client could set up a revolving project development fund, possibly with the support of donor agencies, with the winning bidders refunding the costs of the tender.¹²⁶ The proposed new Chinese-funded African Infrastructure Financing Facility is also intended to cover “upstream” project preparation, amongst other costs. That said, there is a case for creating pre-project support facilities within, or linked to, major lending institutions.

The AfDB estimates that expenditure of Euro 20 million on pre-project support has generated committed finance of almost Euro 800 million for 15 follow-on water projects, with a further Euro 1.2 billion pledged for these.¹²⁷

The following actions are recommended for consideration:

- ▶ Public sector clients of all types should consider making fuller use of existing pre-project support facilities, including making them more useful and user-friendly, in order to develop a stronger pipeline of bankable projects.
- ▶ Public and commercial banks, IFIs and donor agencies

¹²⁶ A proposal along these lines was made in the Camdessus Report (2003)

¹²⁷ From material provided by AfDB to the HLP

should consider including, or strengthening, support for project identification, preparation and other pre-project activities for their clients as an integral part of their lending operations, in order to build up a pipeline of projects eligible for finance. (Several do this already).

- ▶ Governments, IFIs and other key financing agencies should redouble their efforts to improve the *quality* of water projects, especially MPI and other major items of infrastructure. This involves better planning and appraisal, the use of competitive procurement to select bidders offering the best value-for-money, and the use of performance-based contracting to incentivise timely delivery within budget.
- ▶ Governments, with the support of IFIs and donor agencies, could increase their funding of training for officials in elements of project finance to improve their skills in dealing with potential financiers.

Making IFI balance sheets go further

The major IFIs (such as the World Bank, its associated agencies MIGA and IFC, the regional development banks AfDB, AsDB, laDB and CDB, EIB, CAF and others) play a pivotal role in the finance of water infrastructure through their lending and equity operations, their support of technical assistance, and the catalytic effect of their risk-mitigation products such as guarantees. Proposals made elsewhere in this Chapter for the use of guarantees and for the use of pre-project facilities have an important role in this. In addition:

- ▶ IFIs should intensify their co-funding with other lenders in order to put their catalytic role to best advantage, and to multiply the impact of their “value-added” to projects;

IFIs are well placed to mobilise funding from other lenders and donor agencies, who would be reluctant to engage on their sole account. Trust Funds operated by IFIs attract funds from a variety of other agencies and sources. The Nile Basin Initiative, supported by the World Bank, has such a Trust Fund, while the AfDB’s Trust Fund for its Rural Water Supply and Sanitation Initiative, fed by 7 countries, has attracted a sizeable multiple of its original sum in other contributions.

- ▶ IFIs should maximise their use of Trust Funds and other devices to mobilise support from donor agencies and other bodies for water projects, or components of such projects, needing grant funding.

Proposals made in a previous section for IFIs to ramp up the use of guarantee products are relevant in this context.

Blending different types of finance

Creating structures in which different types of finance are *blended* to create tailored solutions for infrastructure is a major theme of the UN’s Intergovernmental Committee of Experts on Sustainable Development Financing (ICESDR, 2014). This chimes with many messages of this Report.

Some water projects lend themselves to finance on full market terms, others need grant or concessional funding. Many more – providing a mixture of services – need *hybrid* finance consisting of packages of finance with different characteristics, terms and maturities. Typically, in project finance these packages are made up *ad hoc* for each project. It has, however, been found useful for suppliers of finance to offer their own blends when dealing with funding requests. This can facilitate the task of project sponsors.

The EU-Africa Infrastructure Trust Fund is one such *platform* in which EU bilateral donors and the European Commission table grant or concessional funds alongside loan finance from other sources, to produce a blend appropriate to each project. The Latin American Infrastructure Fund is a similar organisation. Amongst bilateral agencies, SIDA has announced a Grant Based Facility to Fund Infrastructure which will offer a flexible blend of grant and loan finance, plus technical assistance, for projects in conjunction with banks or multi-finance corporations (www.sida.se).

In this context, AfDB has just formed AFRICA50, a “structured credit vehicle” providing various kinds of finance in order to leverage external financing. Apart from its “blending” function, the fund will also provide early-stage project support in order to create a pipeline of projects. (See Box. 19).

Box 19. Africa50: Leveraging 50 years of the AfDB

The African Development Bank expects to make first use of its new Africa50 structured credit vehicle in the coming months, as it seeks to increase the number of bankable infrastructure projects in Africa. The fund, which expects to leverage \$100 billion of funding from an equity base of \$10 billion, aims to deliver a “critical mass” of energy, transport, ICT and water infrastructure in Africa, whilst shortening the gap between project conceptualisation and financial close from an average of seven years to under three years. To this end, it plans to unlock new sources of funding from the private sector, as well as from sovereign wealth funds and pension funds.

Approved by the board of governors of the African Development Bank in 2013 and endorsed by African heads of state at the African Union Summit in January 2014, Africa50 will provide support both for early-stage project development and in the form of project finance, across a series of measures including bridge equity, senior secured loans and credit enhancement provision. Africa50 will be a completely independent entity, with a separate balance sheet. It was incorporated in October 2014 and is headquartered in Casablanca, Morocco.

The fund plans to target a credit rating in the single-A bracket against which to issue bonds for on-lending to key projects. AfDB will strongly encourage regional member countries to mobilise national resources to support the initiative. A number of donors have also expressed interest in investing. Africa50 has already identified a pipeline of 176 projects worth a total of \$144 billion.

Source: text provided by AfDB to the HLP

Reviewing the World Bank’s experience in hydropower, van Ginneken (2014) advocates “...finding streamlined structures of mixing and matching various sources of financing – including Western and non-traditional financiers” (p. 8) in order to reduce problems that have been experienced with conventional financing models that treat hydropower in the same way as thermal projects¹²⁸. This will be particularly important for the involvement of private financing.

- ▶ New *blending* platforms should be promoted, and existing ones boosted, to provide suitable financing packages for water investments, especially for complex and multi-purpose schemes.

II) SECURE ACCESS TO NEW SOURCES OF FUNDS

Alongside existing sources of finance for water infrastructure, a number of newer sources are set to become important. They include revenues from enhanced urban land value, refinancing existing assets, maximising synergies with new infrastructure financing agencies, attracting institutional investors and Sovereign Wealth Funds, climate finance and Green Bonds. The case for setting up a Dedicated Water Bank is also examined. Proposals are made for ensuring that water projects receive a proper share of finance from these sources.

Financing urban infrastructure from enhanced land values

Urbanisation has a strong correlation with productivity. In China it is estimated that every doubling in city size increases productivity by 10% (World Bank/DRC 2014,- p. 7). More specifically, providing the infrastructure for water services in growing cities increases the value of land and property associated with this development. The development value (*economic rent*) created in this way can be tapped to fund the original water investments.

Developers can, for instance, be required to fund or co-finance local networks as part of larger property developments (Box 20). Alternatively, municipalities can sell land in their possession, or obtain higher rents from leasing their land, and devote the proceeds to fund

¹²⁸ The Independent Power Producer model

investment. Or a portion of land (*betterment*) taxes and municipal rates can be earmarked for developing urban infrastructure.

The American system of *tax incremental finance* consists of issuing municipal bonds to finance urban development, funded by the growth of future tax revenues due to these investments. Many other OECD countries have systems to capture the enhanced property values due to current infrastructure development (OECD, [2015] Ch. 3)

Box 20. LYDEC in Casablanca: funding water supply and sanitation from real estate development

In 1997 the Moroccan Government signed a 30-year concession contract with LYDEC to improve the water supply and wastewater services, and provide infrastructure for stormwater and flood defence, in the Greater Casablanca region. The originality of the contract was the engagement of property developers in financing water and sanitation structural investments falling within the scope of this contract.

The investment programme for 2014-27 was revalued at Euros 2.6 billion, for a current population of 5 million. Part of this was to be funded by LYDEC from tariff revenues, and the remainder from funds mainly provided by real estate developers. The contributions required from developers were billed based on the housing type and area. Over the last 11 years the contributions from developers to the total investment spending has gradually increased, to form more than half of these by 2014. However, the cost for house owners is typically less than 1% of the sale price.

Source: Suez Environnement

- ▶ Municipalities with sufficient financing standing could emulate the US *tax increment financing bonds* to fund urban water infrastructure, in which debt servicing is secured (*hypothecated*) on projected increases in local tax revenues due to this and other development.

- ▶ Householders could be required to contribute more to certain types of urban water infrastructure because they stand to benefit directly (higher property values, flood protection), or because they contribute directly to water risks (run-off from impermeable surfaces). In some countries individual property owners help to fund “green” solutions on their properties having a “win-win” result for themselves and society.(OECD, 2015a).

Refinancing existing infrastructure

Some utilities are exploring options to recycle some of the capital tied up in water infrastructures, to generate cash that can be used for new projects. Long-term investors such as pension funds are potential sources, since they can acquire stakes in these projects while avoiding construction and completion risk. The refinance substitutes for public money in the capital structure of the utilities.

As noted by *Global Water Intelligence*¹²⁹, “the emergence of a relatively liquid market for equity stakes in brownfield water infrastructure projects means that investors who are prepared to assume early risk – including construction risk – increasingly find that there is a natural exit opportunity once a project enters the operational phase.” This is particularly the case in a context where the equity market is highly volatile and bond markets only ensure low yields: some water projects typically generate the stable revenues and limited risks that long term investors are longing for.

Typical deals which involve private equity firms cover desalination, wastewater treatment and reuse projects, for either municipal or industrial clients.

- ▶ Where conditions in financial markets permit, water utilities and sponsors of other water infrastructure projects should consider refinancing their initial debt or selling equity in order to release capital for further investment

¹²⁹ Quoted in OECD (2015) p. 52

Dedicated water funding agencies and facilities (at international, regional or national levels)

The case for having financing institutions dedicated solely to water is worth revisiting. It is currently more common for development and infrastructure agencies to have an infrastructure-wide remit, with a balanced portfolio of assets (energy, transport, telecoms etc. as well as water) in order to balance their risks, and develop economies of scale in building professional cadres, raising finance, etc. The World Bank's new Global Infrastructure Finance Facility and the new Asian Infrastructure Investment Bank will deal with all types of infrastructure, not just water.

But such conglomerate bodies often end by marginalising water, often perceived as the most “difficult” and least profitable branch of infrastructure. Unless officers are given specific targets for water lending they will usually find it easier to meet their targets by concentrating on other infrastructure classes.

There are in fact successful cases of specialised water financing agencies, banks, funds and facilities. The Netherlands Water Bank (*Nederlandse Waterschapsbank NV*) is a well-known example of these, and others include the US Clean Water and Drinking Water Revolving Funds, Korea's Water Resources Company (KOWACO), the Japan Water Agency, the Philippines Water Revolving Fund, and the EU and Africa Water Facilities.

Proposals have been made for a full-scale US Federal Water Infrastructure Bank (cited in Lloyd Owen, 2009, p. 82). One outcome of this debate has been the creation in 2013 of the US Water Infrastructure Finance and Innovation Act (WIFIA) pilot program, providing \$500 million of low-interest loans over 5 years for various types of water infrastructure schemes.

In the lead-up to the Third Conference on Financing Development to be held in Addis Ababa in July 2015, a proposal is under discussion for the creation of a Global Fund for Water and Sanitation as a means of raising finance for the proposed Sustainable Development Goals. This Fund would be strongly Goal-oriented and would help to overcome the current fragmentation in the supply

of ODA and other financing sources for the universal provision of water and sanitation.

One valid objection to the creation of dedicated water financing institutions is that they would prevent the growth of synergy between water with other closely-related sectors such as power and agriculture which are commonly part of MPI. Conceivably, an institutional structure could be devised in which water was grouped with these closely-related sectors in order to promote MPI projects, giving water more weight and clout in development banks and infrastructure development funds with a broader remit.

In this context the proposal to create a national Water Fund in Mexico is also significant¹³⁰. The Water Fund would be a “platform” (to use the term employed in section... of this report) aimed in the first instance at funding the modernisation of irrigation. It would be fed from portions of existing budgetary allocations, raising capital on its own account and acting as a blending platform for other kinds of external funding. It addresses a current gap in the financing market, will take on risks that the market currently shuns, and will offer guarantees to commercial financiers. The fate of this proposal is still unclear, but it is worthy of serious consideration both in Mexico and elsewhere since it focuses attention and resources on a “difficult-to-finance” part of the water sector.

- ▶ Governments and international agencies should give serious consideration to forming specialised funds and “blending platforms” for water infrastructure finance, in order to create a strong professional capacity solely focussed on developing a pipeline of water projects, and to avoid the marginalisation of water that tends to occur in finance facilities dealing with all infrastructure categories.
- ▶ In financing institutions with a remit across all infrastructure, to preserve synergies with closely related sectors such as energy and agriculture, water could be grouped with these others for professional and operational purposes.

¹³⁰ Campanaro & Rodriguez, 2014, pp 31-34

Engagement & co-funding with recent and new infrastructure financing agencies

The imminent arrival on the international scene of two new development banks¹³¹, each the size of (or larger than) the World Bank is bound to have repercussions. Existing IFIs are concerned about their “market share”, and there are fears of a “borrowers’ market” creating a “race to the bottom” in the standards and conditions associated with development finance.

In fact, this development could have a number of positive features, and not merely for borrowers. Current thinking about the AIIB¹³² favours the evolution of standards and practices closely following those of existing IFIs. This is not surprising, in view of the growing evidence of problems and costs where there is neglect of essential procedures and safeguards in the planning and implementation of water infrastructure¹³³.

Moreover, to take one case, the constructive engagement of the World Bank and Asian Development Bank with the Chinese authorities within China shows the possibility of synergies developing in the cooperation of these IFIs with Chinese institutions on a wider stage. In Africa, the World Bank and China are jointly involved in the planning and implementation of the major Inga Dam in DR Congo.

- ▶ IFIs should fully engage with the abovementioned banks in the development of modalities and protocols for the finance of water infrastructure and should seek every opportunity of co-funding with them.
- ▶ The case of the joint involvement of the World Bank/ IFC and China in the planning of the major Inga Dam in DR Congo should be publicised, and appropriate lessons disseminated.

Attracting institutional investors (IIs) and Sovereign Wealth Funds (SWFs) into water

There are practically limitless funds potentially available for infrastructure held by IIs (especially pension funds and insurance companies) and SWFs. Some of these funds have targets for the proportion of their assets held in various infrastructure classes, of which water is one. Overall, IIs have a low exposure to water , and

infrastructure more generally. Pension funds only have 3% of their global assets in infrastructure and only a fraction of this would be for water.

Most IIs are seeking a portfolio including assets offering different combinations of risk and reward. They are all subject to their fiduciary obligations as enforced by national regulators. Although they profess to take a long-term view of investments to match their liabilities, they also need liquid securities they can trade in active markets. The latter militates against investment in project finance deals, and in companies and utilities lacking a good track record and sound financial prospects.

Another important factor is the difficulty and cost of appraising and structuring infrastructure deals of all types. In the case of water a minimum throughput of deals is necessary to justify employing specialists and the lack of such deals creates a vicious circle discouraging future involvement further. In this context it is relevant that South African pension funds are setting up a jointly owned infrastructure fund, in order to obtain economies of scale (ICESDF, 2014, p. 36)

Water does not currently feature highly in II portfolios, with some notable exceptions such as Brazil, Peru and some other Latin American countries where regulators lay down specific conditions for II involvement. In Peru they require i) concession contracts should be awarded after competitive bidding, ii) projects should be above US\$10 million or equivalent in local currency, iii) the bond or share issuer has a track record of solvency and creditworthiness, certified by a credit risk agency, and iv) operating partners should have demonstrated successful experience. As a result, Peruvian IIs have been substantial investors in infrastructure project finance deals, including urban water, hydropower and inter-basin transfer (Requena & French, 2009).

In UK the Government has created a Pensions Infrastructure Platform to facilitate investment by British pension funds in public infrastructure projects backed by the UK Treasury. Likewise in France the *Caisse des Dépôts et Consignations* is making household savings available for investment in local infrastructure projects and social

¹³¹ The BRICS Bank owned by Brazil, Russia, India, China and South Africa will have an initial capital of US\$50 billion, and the Asian Infrastructure Investment Bank owned by China and two dozen other mainly Asian countries will have US\$100 billion. These sums will leverage much larger lending volumes.

¹³¹ As presented at the Beijing Workshop, Sept 2014

¹³² van Ginneken (2014) has some examples

housing schemes (ICESDR, 2014). These initiatives signal the scope for proactive public efforts to harness public savings for the funding of public infrastructure.

Accordingly it is recommended for governments and regulators to:

- ▶ Engage with institutional investors and the appropriate national regulators to identify features of the national regulatory regime that would encourage greater involvement of IIs and SWFs in the funding of water infrastructure.
- ▶ Encourage the spread of credit rating agencies in emerging capital markets in order to increase ratings of local currency and sub-sovereign debt (as in India)
- ▶ Encourage water companies and water authorities to issue securities with features (interest, tenor) appealing to institutional investors and Sovereign Wealth Funds (e.g. efforts made by UK water companies in 2008-9).
- ▶ Give greater publicity to the existence of water debt and equity, and to its relatively strong financial performance, amongst analysts and the investment community more widely. Promote these securities as “green” investments.
- ▶ Support the promotion of a new Infrastructure Asset Class through the standardisation of financial instruments, disclosure rules, risk management tools, etc.¹³⁴

Climate finance

This will become potentially important in funding the creation of new, and the adaptation of existing, water facilities to make them more climate-resilient. Water is often portrayed as a passive medium (“victim”) of climate change because of the latter’s impact on hydrological patterns. However, water is also a contributor to greenhouse gas (GHG) emission through its large, and generally very inefficient, use of energy, and from emissions of methane from reservoirs. Water should therefore have a claim both on funds for climate mitigation (e.g. through wastewater to energy projects)

and for adaptation, though it is likely to have a stronger claim to the latter. Due to its side-effects on GHGs, hydropower, although a renewable source of energy, is subject to restrictive criteria applying to its eligibility for climate funding.¹³⁵

It is recommended:

- ▶ Governments ensure that the Green Climate Fund in the course of establishment keeps a proper balance in its operations between climate mitigation and adaptation, in order to assure water investments a fair share of the funds.
- ▶ Water utilities and other service operators stake a strong claim to the various sources of climate funding, both for mitigation and adaptation.
- ▶ The new Green Climate Fund should be encouraged to use its concessional funding to blend with other forms of finance in order to maximise its leverage.

Green Bonds

- ▶ IFIs and large corporate firms can currently find a growing market for reputable Green Bonds amongst institutional investors and others.
- ▶ There is potential for larger water and power companies to use Green Bonds particularly for energy-efficient processes, including conversion of wastewater to energy and heat.
- ▶ International development agencies, including IFIs and the UNEP Finance Initiative should be closely involved in ongoing discussions in the Climate Bonds Initiative to agree the criteria on what counts as Green Bonds and on the arrangements for transparency and monitoring applying to these securities.

Report of the Intergovernmental Committee of Experts on Sustainable Development Financing

This Committee was formed in 2013 under the auspices of the UN, comprising 30 experts, and met 35 times over the course of 2013 and 2014. Its aim was to “assess

¹³⁴ A proposal of the Secretariat of the Sustainable Development Solutions Network (SDSN) in *Elements of a possible Addis Declaration on Financing for Sustainable Development*.

¹³⁵ These criteria are evolving, but currently relate to the power density of hydropower schemes, measured by the installed capacity of the plant (in watts) divided by the area of the reservoir (in m²). Run-of-the-river schemes would score more highly than stored water schemes, on this criterion.

financing needs, consider the effectiveness, consistency and synergies of existing instruments and frameworks, and evaluate additional initiatives, with a view to preparing a report proposing options on an effective sustainable development financing strategy to facilitate the mobilisation of resources and their effective use in achieving sustainable development objectives” (ICESDG 2014, p. 3).

Water is only one of the financing requirements considered. The Committee offers a “basket” of policy measures, “encompassing a toolkit of policy options, regulations, institutions, programs and instruments”. The instruments and modalities are categorised as domestic public, domestic private, international public and international private. There is a fifth category of “blended finance” which is broader than, but which includes,

the concept as used in the current Report (*ibid.* p. 39). ICESDG also reviews the proposals of the Leading Group on Innovative Financing for Development, which include an international solidarity levy on air tickets (used for the purchase of drugs) and a financial transactions tax.

Although the ICESDG has a much wider scope than the current Report, most of the latter’s proposals find echoes in it, especially those concerning blending finance of different kinds.

- ▶ Governments should take note of the Final Report of the ICESDG and its relevance for water, and consider their positions at the Conference on Financing Sustainable Development, scheduled for July 2015 in Addis Ababa. ■



CHAPTER 7

THE AGENDA

This Chapter presents an agenda for the implementation of the various actions contained in this Report.

It draws together recommendations and proposals for action made in the Report as they affect specific categories of stakeholders and their representative groups.

It does **not** include conclusions and guidance in the Report of an intellectual or practical nature relevant to professionals and practitioners. Rather, it focuses on policy or advocacy actions that can be taken by institutions, agencies and bodies representing specific stakeholder groups.

The Members of the High Level Panel undertake to take the Agenda forward in their own organisations and domains and urge other stakeholders to note the relevant points and to respond to them, including how they would intend to take the agenda forward, and commitments they would be prepared to make.

CENTRAL AND LOCAL GOVERNMENTS & FINANCIAL REGULATORS

Policy & governance

- ▶ Review the policy framework for water to provide clarity about national objectives, and to create the laws, institutions, incentives and other aspects of the *enabling environment* necessary to induce investment and its means of financing.
- ▶ In particular, consider water allocation regimes that allocate water and risks in a way that is fair and that stimulates innovation and investment.
- ▶ Endorse, study and report on implementation of the OECD's principles of Water Governance and progressively implement these in water development strategies.
- ▶ In view of the heavy costs of corruption, falling on all parts of society and which discourage legitimate businesses, Governments are urged to engage with the Integrity Pacts in the Water Sector produced by the Water Integrity Network and Transparency International.
- ▶ Consider the OECD Framework for Financing Water Resources Management to guide policy in this and related matters.

Public Procurement

- ▶ Make full use of international competitive procurement in tenders for water projects
- ▶ Recognise and engage with the new "water entrepreneurs" in soliciting Expressions of Interest and drawing up shortlists of bidders, e.g. equipment suppliers, construction companies, and companies from Brazil, China, Singapore, India and the Philippines, amongst other new water players.

- ▶ consider more use of Design, Build, Operate, Transfer contracts to access private expertise in the earliest stages of designing projects
- ▶ Make more, and wider, use of Results-Based Financing and Performance-Based Financing by contractors and partners in the design, procurement, implementation and operation of water infrastructure

Development of finance and capital markets for water projects

- ▶ develop municipal bonds as a financing instrument on the *tax increment financing* principle
- ▶ Encourage the spread of credit rating agencies in emerging capital markets in order to increase ratings of local currency and sub-sovereign debt
- ▶ Work for the promotion of a new Infrastructure Asset Class through the standardisation of financial instruments, disclosure rules, risk management tools, etc.
- ▶ Promote the growth and spread of Green Bonds to include water infrastructure.
- ▶ take note of the Final Report of the ICESDG and its relevance for water, and take an appropriate position at the Conference on Financing Sustainable Development, scheduled for July 2015 in Addis Ababa.

Public-Private Partnerships

- ▶ where private sector participation is being considered for water supply and sanitation services, observe the OECD's Checklist for Public Action to create an "enabling environment" and make the best use of PSP.
- ▶ consider ways of combining PPP with targeted social support where tariff affordability amongst the poor remains a challenge

Other matters

- ▶ assess the feasibility of pooling the resources of small and medium sized cities in order to achieve the efficiencies that go with economies of scale.
- ▶ make fuller use of existing pre-project support facilities, including making them more useful and user-friendly, in order to develop a stronger pipeline of bankable projects
- ▶ Provide and promote adequate funding for R&D and innovation in water, using research grants, challenge funds, prizes, support of pilot ventures, venture capital, and other means
- ▶ Review and reduce unnecessary barriers to the diffusion of innovative approaches to water management and services.

WATER REGULATORS

- ▶ Review regulatory practices in the light of the Lisbon Charter and other relevant statements of international good practice
- ▶ Maintain tariff guidelines for water services consistent with progress towards full cost recovery.
- ▶ take account of the *affordability* of tariffs, after covering essential O&M and maintenance of the quality of service, as a criterion in oversight of water providers
- ▶ Recognise existing informal service provision, and review laws and regulations that hamper legitimate businesses involved in this sector.

“PRODUCTIVE” WATER USERS IN AGRICULTURE, INDUSTRY, ENERGY, MINING, TOURISM, ETC.

- ▶ Promote “good housekeeping” and stewardship of water, including further work on identifying “water footprints”¹³⁶ and taking appropriate actions.
- ▶ Develop indicators of “water risk” to their operations, including Value At Risk metrics to help quantify their dependence on water, for the information of their shareholders, customers and other stakeholders.
- ▶ Engage in water development, management and conservation in host communities and regions, including investment in, or co-funding of, projects relevant to securing their resource, customer or operational base.
- ▶ Use publicity, information and awareness-raising in corporate and official representative circles, including the Global Agenda Council on Water of the World Economic Forum, the World Business Council for Sustainable Development, the National Contact Points for the OECD Guidelines for Multinational Enterprises and other fora.
- ▶ In corporate philanthropy programmes and CSR initiatives, promote innovative technologies, business models and methods of water financing with the potential for scaling up.

¹³⁶ E.g. through the Water Footprint Network.

BANKS AND OTHER COMMERCIAL FINANCING AND INVESTMENT INSTITUTIONS

- ▶ Engage with regulators to identify features of the national regulatory regime that currently discourage investment in water securities and projects by institutional investors and Sovereign Wealth Funds
- ▶ Encourage water companies and water authorities to issue securities with features (level of risk, interest, tenor, etc) appealing to investment institutions

WATER UTILITIES AND OTHER WATER SERVICE PROVIDERS

- ▶ Continue and intensify efforts to improve bill collection
- ▶ Promote the use of life-cycle costing and integrating operating and capital costs (opex-capex coupling) in order to optimise costs and financing needs over the lifetime of the asset.
- ▶ Enhance operational efficiency and introduce optimal maintenance procedures based on a risk assessment of assets to minimise O&M costs and make best use of limited maintenance budgets.
- ▶ Consider greater recourse to refinancing existing debt in order to release capital for further investment
- ▶ Take a pragmatic view of the potential for public-private partnerships, focussing on evidence of the *actual or likely performance* of PPPs, including their value-for-money, impact on tariff levels, affordability, and quality of services to poor consumers and those previously unserved.

- ▶ consider the potential of wastewater treatment as a profitable business opportunity through the sale of treated water for re-use and the sale of heat and power generated in the treatment process.
- ▶ stake a claim to climate funding sources, both for mitigation and adaptation, and tap into these funds for the adaptation of water systems and installations (e.g. for greater energy efficiency) and for new business products (e.g. power and heat from wastewater).
- ▶ Consider and, as appropriate, implement, “smart” solutions in tariffs and other aspects of their operations in order to increase efficiency and net revenues to generate and leverage more finance.

INDIVIDUAL WATER USERS & DOMESTIC CONSUMER GROUPS

- ▶ Take full advantage of promotions and inducements offered by service providers for the purchase of equipment or installations that improve efficient water use, or for “greening” domestic water and rainwater systems.

INTERNATIONAL AND REGIONAL AGENCIES, NETWORKS & RESEARCH BODIES (inc. UN, OECD)

- ▶ (WWC, GWP, OECD) develop a communications strategy for spreading evidence of the link from water to growth, starting with results from the Global Dialogue on Water Security and Sustainable Growth of GWP and OECD. This should include the use of “stories” and historical evidence. Messages should target key decision makers and their key advisers, e.g. economists working in development financing and donor agencies. Insights from the “Nexus” should be part of this.
- ▶ (OECD *et al.*) Refine, develop and adapt the concept of the 3Ts to maintain and enhance its relevance to the finance of water services. This would include the development of an improved system of classification of different types and sources of finance for water OPEX and CAPEX.
- ▶ (UN, UNEP FI *et al.*) Ensure that the Green Climate Fund in the course of establishment keeps a proper balance in its operations between climate mitigation and adaptation, in order to assure water investments a fair share of the funds, and encourage the GCF to use its concessional funding to blend with other forms of finance in order to maximise its leverage.
- ▶ (UN, UNEP FI) use ongoing discussions in the Climate Bonds Initiative to agree the criteria on what counts as Green Bonds and on the arrangements for transparency and monitoring applying to these securities.

INTERNATIONAL FINANCING INSTITUTIONS

- ▶ intensify co-funding with other lenders in order to put their catalytic role to best advantage and multiply the impact of their “value-added” to projects;
- ▶ Where means exist, expand use of local currency financing for water infrastructure and use their range of products to support the growth of local capital markets for this purpose.
- ▶ review the use and uptake of risk mitigation products and examine ways of removing obstacles to their use and to focus efforts on using these products where they will be most effective.
- ▶ support project identification, preparation and other pre-project activities for borrowers as an integral part of their lending operations, in order to build up a pipeline of projects eligible for finance
- ▶ maximise use of Trust Funds and other devices to mobilise support from donor agencies and other bodies for water projects, or components of such projects, needing grant funding.
- ▶ engage with the planned new international infrastructure financing banks (BRICS Bank, Asian Infrastructure Investment Bank and any others under discussion) in the development of modalities and protocols for the finance of water infrastructure and seek every opportunity of co-funding with them.
- ▶ tackle the financing challenges of multi-purpose infrastructure head-on by raising its profile in the IFI, stating the IFI’s policy towards water MPI and the instruments to be used to promote such projects, and consider the creation of a group of staffers specialising in the complex financing structures characterising MPI projects .
- ▶ (World Bank, PPIAF) consider the feasibility of PPIAF¹³⁷ identifying MPI as a separate category in its database and analytical work, and disseminate data on exemplary and successful financings of MPI projects.

- ▶ (IFIs) play an active part in the negotiation, planning, implementation and financing of transboundary MPI projects (including convening Round Tables of potential financiers)
- ▶ In their loan operations, include options for funding for both CAPEX and OPEX in the early years of new projects

OFFICIAL DONOR AGENCIES

- ▶ Promote new *blending* facilities and boost existing ones in order to provide suitable financing packages for water investments, especially for complex and multi-purpose schemes.
- ▶ Where feasible, include more funding for O&M in their financing packages.
- ▶ Expand their use of local currency financing for water infrastructure and use their range of products to support the growth of local capital markets for this purpose.
- ▶ Reorient grant support towards the expansion of household water connections.
- ▶ Consider and report on the need for, and feasibility of, a new funding, guarantee and/or blending facility dedicated to water, which might be specific to a region.
- ▶ Increase funding of training for officials in elements of project finance to improve their skills in dealing with potential financiers.

CIVIL SOCIETY ORGANISATION, NGOS AND EDUCATORS

- ▶ Use all evidence, education and advocacy to raise investment in water security onto a higher place on the development agenda and play an active role in on-going discussions to finalise the Sustainable Development Goals
- ▶ Work to raise the level of interest in *financing issues* concerning water, and seek to influence the outcomes of the Conference on Financing for Sustainable Development scheduled for Addis Ababa in July 2015
- ▶ Advocate policies encouraging the spread of new approaches and new providers in the supply and financing of water services to poor and marginalised communities

MONITORING AND FOLLOW-UP

It is proposed that:

- ▶ financing water infrastructure should be a prominent item in all future World Water Fora
- ▶ water financing should feature on the agenda of other high-level events such as the G20 and annual meetings of the World Economic Forum.
- ▶ The contents of this Report should be publicised at the forthcoming (July 2015) Conference on Financing Development, scheduled in Addis Ababa.

In order to create and maintain momentum on this topic, it is proposed

- ▶ WWC and OECD jointly lead an initiative to develop by the end of 2016 appropriate benchmarks and metrics by which progress on the above Agenda would be measured.
- ▶ Progress against these benchmarks would be reported to subsequent World Water Fora. ■

APPENDIX I

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APPENDIX 2

WRITTEN MATERIALS RECEIVED

Written text, memoranda and reports were received from the following individuals and institutions:

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Global Water Intelligence	US Army Corps of Engineers
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