

# HIGH LEVEL PANEL ON FINANCING INFRASTRUCTURE FOR A WATER-SECURE WORLD



**BRIEFING NOTE & ISSUES PAPER**  
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Part I of this document contains briefing on the background to the formation of the HLP, relevant information on the current status and trends in the financing of water infrastructure, and estimates of future needs. Specifically, it includes:

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Part II is an annotated list of some of the key issues that the HLP may wish to focus on.

## PART I. BRIEFING NOTE

### WHY THE HLP HAS BEEN FORMED

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's aim is to stimulate a dialogue on the role of infrastructure in providing water security, and identify the financial resources - and the means to generate them - for achieving water security in different parts of the 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 context for the Panel is the WWC's Pact for Water Security which is a key part of the Council's Strategy for 2013-15. This Pact commits the Council to work on a number of essential topics – the right to water, the water-food-energy nexus, water for health and nature, climate and water-related disasters, demographic and urban development, water and Green Growth, and Integrated Water Resources Management.<sup>1</sup>

Evidence is growing<sup>2</sup> that investing in water security is an essential condition for economic growth and for breaking cycles of poverty. This evidence needs

to be driven home to governments and key decision makers in other realms of society in order to justify investment in water infrastructure as a basic platform for socio/economic development.

Water security depends on many factors, particularly good infrastructure and governance. The importance of these factors will vary by country, depending on its history, level of social and economic development, geography and climate.

Back 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 momentum created by this previous report and that of its successor the Gurria 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 sanitation<sup>3</sup> in the context of the Millennium Development Goals for these basic services.

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[1] WWC: A Pact for Water Security: World Water Council 2013-15 Strategy. May 2013.

[2] Evidence on this is being assembled in the Global Dialogue initiative of the GWP, OECD and World Bank

[3] The Gurria Task Force also examined agricultural water security

## THE PURPOSE OF THE HLP

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.

## SCOPE OF THE HLP'S WORK

**Water Security** involves managing a number of risks:

- For households, insufficient access and entitlement to water supply, sanitation, and safe wastewater disposal. Access to safe drinking water and sanitation is now accepted as a human right.
- Water shortage, including droughts: insufficient water to meet the needs of households, businesses, farmers and other beneficial users.
- 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;
- Excessive water at certain times and locations, including flooding and high levels of groundwater;
- Undermining the resilience of freshwater ecosystems systems by over-abstraction of water, pollution, destruction of catchments and wetlands, etc.

In considering the finance of water security the HLP will take a broad view of “water” including infrastructure and services for strategic water storage, water resource development and management and bulk water supply, as well as water for specific uses such as hydropower, irrigation, municipal and domestic water supply, navigation, flood risk reduction, , recreation, ecological system services, critical flow level assurance and other purposes.

Other aspects to be considered will include financing the Sustainable Development Goals, now being discussed as a successor to the Millennium Development Goals, Green Infrastructure, strategic water asset management, “smart” water systems, and sustainable urban planning, amongst other topics.

The HLP will draw on parallel work on governance being conducted at OECD and elsewhere, and on work on financing the Green Economy and ecosystem services under way in other institutions.

The reasons for choosing this focus for the HLP are:

- Despite the progress made in extending water services, and to a lesser extent sanitation, to households in the context of the Millennium Development Goals serious problems remain, which are being addressed in the Sustainable Development Goals now being finalised in UN fora. These Goals, which include water, will have major financing requirements.
- There are growing needs of water for power, industry and agriculture, a massive need for the replacement and rehabilitation of old infrastructure in mature water systems, and the adaptation of existing infrastructure assets to the likelihood of future climate changes.
- Much of the infrastructure that needs to be created has a multi-purpose nature, which makes it more complicated to finance from commercial sources, since several different funding sources are necessary. Current spending on water is below the level required, as determined by most objective assessments

Water infrastructure needs financing over its full life cycle, including planning, appraisal, implementation, operation 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 will consider 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 more gravity to its conclusions.

The nature of the “water challenge” varies by country and region, as Table I illustrates. Each of these challenges has financial implications and financing needs.

Table I. Typical water challenges of different countries &amp; regions

Region or country	Typical water challenges
Latin America	Multipurpose projects for hydropower, irrigation & bulk water; Water resources management & ecosystem preservation; Water services for households and industry in the context of rapid urbanisation
Middle East & North Africa	Water scarcity & new water resources for rapidly growing populations Irrigation, wastewater re-use & desalination Backlog of sewerage & wastewater treatment Water pollution
Sub-Saharan Africa	Hydropower & multi-purpose infrastructure for electrification, irrigation & strategic storage; Water & sanitation services for growing cities & industries; extending services to poor & marginal urban areas ; Extending rural water & sanitation services
South Asia	More efficient & productive irrigation for food security; Bulk water for growing populations, urbanisation, industry; Growing need for hydropower; Serious deficiencies in urban water services Extending services to poor & slum areas.
China	Growing water shortages in North; Flood management in all regions; Backlog in wastewater collection & treatment; Costly storage & water transfer schemes; Allocation of water between use sectors, pricing & demand management
Australia	Inter-sectoral allocation amidst growing water scarcity; Demand management
USA	Heavy cost of rehabilitating ageing infrastructure; Constraints on federal government spending; Inter-sectoral allocation amidst growing water scarcity, made worse in some regions by fracking for shale gas.; Demand management in urban & farming areas in Western states
N & W Europe	Cost of rehabilitation of old systems; More efficient water usage in all sectors; Cost implications of EU legislation; Regulation & models of service provision
Eastern Europe, Russia, Central Asia	High cost of adapting existing water infrastructure to new social and economic demands; Cost recovery from users; Backlog of sewage & wastewater treatment; Water pollution & aquifer contamination

## HLP'S PREDECESSORS

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 game-changer in discussions of water financing, 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 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 group of “wise persons” to monitor and report on progress on these and other issues involved in progress towards, and financing of, 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. Amongst other actions, UNSGAB 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 (Gurria) Task Force on Financing Water for All 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.



## NEW WAYS OF THINKING ABOUT WATER

Since 2000 there are signs of a new mindset in the way water is debated in popular and professional circles. These new attitudes are starting to feed into political and economic discourse:

- A better understanding of the link between water security and economic growth. Many countries need no reminder of this since water has dominated their lives for centuries or even millennia. Other countries have been made aware of the correlation between hydrology and economic performance<sup>4</sup> through greater climatic variability and more frequent extreme events.
- Acceptance of the need for reforms in the governance & institutions of water. This is typified by the OECD's Water Governance Initiative, stressing – amongst other things - better service provision, more transparency and less corruption, greater stakeholder involvement and the spread of river basin-scale management.
- Scenarios of future water demand have been produced showing the incompatibility between unrestrained growth in demand and the availability of water. In OECD scenarios, “unrestrained” 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%). In the face of these competing demands, there will be little scope for increasing water for irrigation.
- Increasing concern about climate change & its implications for water security (both for the “climate proofing” (adaptation) of existing infrastructure and in the need to mitigate the contribution of water services and assets to greenhouse gas emission. The message has resonated through recent high profile flooding and drought episodes in countries at both ends of the development spectrum.
- There is now greater international acceptance of the need for dams and water storage projects, compared with the immediate aftermath of the 2000 Report of the World Commission on Dams. At the same time, there is growing concern about the efficiency of dams. There is now a more balanced discussion of dams focussing on such questions as “where”, “what kind”, “how big” and “how to minimise harmful side-effects” of such structures instead of a crude “pro and con” argument. Meanwhile, dam construction has continued apace, funded by national Governments and export credits, particularly from China.<sup>5</sup>
- Better understanding of the reality of competition between different water users, and the impact of decision in other sectors (e.g. agriculture, energy) on water. This is symbolised by the metaphor of the Nexus – the interrelationship of water, food, energy and environment. There are many cases of policies in other sectors (e.g. for energy or food security) having unintended but detrimental effects on water (and vice versa).<sup>6</sup> The Nexus also suggests opportunities for water to be funded as part of joint projects involving other sectors, particularly energy.
- Anxieties by major international companies about their exposure to “water risk” and continuing development of the concept of the Water Footprint of companies and whole countries<sup>7</sup>.
- Water is crucial in the Green Economy paradigm. Sustainable development with lower Greenhouse Gas emissions, exerting less stress on the natural environment, implies better water management,

[4] GWP/OECD/World Bank Global Dialogue

[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] Further explored in Waughray (ed.), 2013. Also in WWAP (2014). The Nexus is the topic of OECD's Global Forum, Paris, Nov 27-28, 2014.

[7] “Water shortages more pressing than climate change, warns Nestle head” Financial Times, p. 1, 15 July 2014.

more efficient water use, and reliance on nurturing “green infrastructure” such as catchments and wetlands to sustain water resources.

- Since 2010 the human right to safe drinking water and sanitation has been promulgated by the UN. This has had an impact on many countries where it has stimulated legal and institutional changes as well as debates on the affordability issue. Although this “right” does not imply that water services should be free of charge, the UN recommends that water costs should not exceed 3% of household income.<sup>8</sup>
- Recent and well-publicised estimations have

been made of the of the huge potential investment required in water infrastructure in all countries and the financing implications of this. Although the different sources produce different estimates, the typical range of costs implies sizeable increases in investment compared with present levels.<sup>9</sup>

- As already noted, after 2015 the Millennium Development Goals will morph into the Sustainable Development Goals – one of which will be for water. These are more ambitious and broader in scope than the MDGs, with greater cost implications.

## WHAT HAS CHANGED – IN THE FINANCE OF WATER INFRASTRUCTURE?

In the finance of water infrastructure too, much has changed in the last decade.

- Striking improvements in the financial status and prospects of many developing and emerging countries, linked to economic growth, typically based on buoyant exports. Between 2005 and 2012 GDP grew by 6.1% annually in developing countries, compared with 1.2% in developed countries.<sup>10</sup>
- Growth in the number of countries issuing sovereign bonds (e.g. in Africa), some of them in their own currencies (e.g. Mexico, Brazil, China).
- Sizeable growth in the size of the market for water infrastructure and services in Latin America, Asia and Africa.
- China and several other emerging economies have become important financiers of dams and other water infrastructure.
- A decline in commercial bank lending, particularly since the international financial crisis of 2008. A number of banks have drastically scaled down their project financing operations.
- Major IFIs (the World Bank and the African, Asian and Inter-American Development Banks have adopted new policies, structures and practices for water finance, and have restructured to facilitate such lending.
- Disbursements of aid (ODA) from many OECD/DAC members for water supply and sanitation has shown slow growth since 2008 after several years of stagnation.
- New sources of finance have been developed for climate change mitigation and adaptation.
- 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, the greater selectivity of Western water multinationals in their overseas ventures has been offset by the vigorous expansion of new companies from emerging markets, both in their home markets, and further afield.

[8] UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC)

[9] McKinsey Global Institute (2011) Resource Revolution: Meeting the world's energy, materials, food and water needs; McKinsey & Co, (2013) Infrastructure productivity: how to save \$1 trillion a year. January 2013.

[10] Report of the Intergovernmental Committee of Experts on Sustainable Development Financing. Final Draft, 8 August, 2014. P. 8

There has also been a change in the way the discussion of water financing is framed. The concept of the 3Ts introduced by the OECD in 2009 has clarified international discussions on this topic by distinguishing the ultimate sources of funding (public budgets, revenues from water-users and aid

and other solidarity mechanisms) from repayable finance (the supply of which depends on the cash flows provided by the 3Ts). There is also a better recognition of the importance for water utilities of creditworthiness and access to local financial markets.

## 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.

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. The following illustrates the variety of systems in place and the absence of a single preferred model of finance:

- **Coherent systems of water finance with a high degree of cost recovery from users** (consumers or polluters). France, organised into six river basin organisations (Agences de Bassin) follows the philosophy of “water pays for water”. The Netherlands also has comprehensive mechanisms for recovering the costs of its water infrastructure and services<sup>[1]</sup>. 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 water services from
- **users through tariffs, abstraction charges and pollution charges.**
- **Large items of infrastructure predominantly funded by Government budgets and long term finance 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 US 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).
- **Involvement of private operators in the finance of water services.** At one extreme are England and Wales<sup>[2]</sup> and Chile where water assets have been fully divested to private owners with finance raised from market sources (though in England flood management is the responsibility of the public Environment Agency, funded from general taxation). France, Spain and Italy rely on long-term Public-Private Partnership contracts 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 make widespread use of Public Private Partnerships for individual water systems covering a sizeable minority of their respective populations.

[11] OECD: water governance in the Netherlands: fit for the future? 2014 (seen in draft)

[12] Other parts of the UK (Scotland and Northern Ireland) have their own (publicly owned) systems

- **“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.
- **Municipal bonds** have been a traditional means of financing urban water services in large cities of Europe and North America (privileged in the USA by their tax-exempt status) and elsewhere. Smaller towns and cities have pooled their resources in some cases to share a single bond issue (e.g. Tamil Nadu, 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.
- **National revolving funds** involving “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 have successful schemes of this nature.
- **Large surface irrigation schemes** are typically financed by governments, with the help of IFIs, though many large estates are owned and financed in private hands. Groundwater irrigation is overwhelmingly privately owned and financed.
- **Pollution control** (building wastewater treatment works, decontamination of polluted water bodies, etc.) is funded partly or wholly from pollution charges in many countries, following the Polluter Pays principle. This is common in Central and Eastern Europe, where revenues from pollution charges are earmarked for spending on anti-pollution purposes.
- **Multi-purpose infrastructure and other large structures** (e.g. dams, conveyances) normally involve a basket of funding comprising public equity, grants and loans, export credits, commercial loans from local or foreign banks, plus donor support 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.
- **Expenses of Water Resources Management** commonly fall on central government budgets, 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** such as wetlands, deltas, etc. tends to fall by default on public funding. It is estimated that in 2013 US\$9.6 billion was invested 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.<sup>13</sup> 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.
- Finally, the **funding of the recurrent costs for operation and maintenance** of water services to households, industry, public institutions, farmers, hydropower companies, etc. is normally covered by tariffs charged for the water supplemented by public subsidy for the unfunded element of costs.

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[13] Bennett, G. & N.Carroll (2014): Gaining depth: State of watershed investment 2014. Report for Forest Trends Ecosystem Marketplace, August.

## TRENDS, PROSPECTS, AND POTENTIAL OF MAIN SOURCES OF FINANCE FOR WATER INFRASTRUCTURE

The trends, outlook and potential for the main sources of water finance are summarised in Table 2.

Table 2: trends, outlook & potential of water financing sources

Financing source	Trend since 2000	Future outlook	Potential scale & determining factors
<b>3Ts.(1) Tariffs</b>	No clear trend. Weak cost recovery in most water supply & surface irrigation systems.	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
<b>3Ts (2) Taxes</b>	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
<b>3Ts (3) Transfers from ODA &amp; philanthropic sources</b>	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	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 <sup>14</sup> .

[14] Output Based Aid, Results Based Aid

Financing source	Trend since 2000	Future outlook	Potential scale & determining factors
<b>Public development banks</b>	Huge increase, esp. in middle income & emerging markets	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
<b>Commercial (public &amp; private) banks</b>	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)
<b>Municipal bonds</b>	USA largest user, declined after reduction of “monoline” insurance” after 2007-8	Growth likely, especially in OECD and some more creditworthy countries.	Well established in India, China, Brazil & some other emerging countries with large & creditworthy cities. Often relies on guarantees from central government.
<b>Project bonds</b>	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 treatment plants)
<b>Institutional investors &amp; Sovereign Wealth Funds</b>	Major growth	Rapid growth	Almost infinite supply of funds for securities (bonds, equities) offering desired balance of risk and reward.
<b>Private equity funds</b>	growth	Continued growth	Mainly for OECD countries; few projects offers required profitability & risk profile. But provide liquidity (exits) to infrastructure finance market
<b>Venture capital</b>	?	Growth expected	Minor overall, but vital in supporting unproven technology

<b>Financing source</b>	<b>Trend since 2000</b>	<b>Future outlook</b>	<b>Potential scale &amp; determining factors</b>
<b>International Financing Institutions (IFIs)</b>	Continuing growth & revival of lending 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
<b>Export credit</b>	Rapid growth, esp. from Chinese and Japanese sources	Continuing growth	A key source for all projects; short/medium term funding, with forex risk.
<b>Climate funds</b>	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. Highly fragmented supply.
<b>Private equity &amp; PPPs</b>	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 own markets and abroad.	Growing demand for expertise of private operators; their direct financial contribution unlikely to be large, but indirect impact critical.
<b>Property developers</b>	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.

## WHAT FUTURE WATER INFRASTRUCTURE WILL BE NEEDED, AND WHAT WILL IT COST?

The main **drivers** affecting the need for water infrastructure in future will be:

- Extension of safe water and sanitation services to those populations currently without these, in pursuit of the proposed new Sustainable Development Goal for water;
- Population growth, rising living standards and changes in consumption habits (including greater urbanisation), leading to more water consumption per head both directly and through their food intake
- 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 pre-treatment of industrial effluent;
- Increasing awareness of the value of ecosystems and biodiversity, the services they provide, and the requirement to account for them. e.g. Water Framework Directive, Ramsar Convention;
- Changing benchmarks of international, national and public expectations of WSS services;
- Overdue need for replacement and rehabilitation of elderly infrastructure in mature water systems. A similar problem arises in newer systems where essential spending on O&M has been neglected, causing premature malfunctions;
- Technological developments in the nature of water services and infrastructure. Many of these are already underway, and others are unforeseeable;
- Growing uncertainty about water availability and demand, due to climate change, which potentially translates into new demands for water security; and
- Growing numbers of people exposed to risks of flooding and other extreme climate events.

A number of **estimations** have been made about the cost of future water infrastructure, the results of which are summarised in Table 3.



Table 3. Estimations of cost of future water infrastructure

Author(s)	Scope of study	Methods and sources	Annual costs US\$ billion
<b>World Water Vision 2000</b>	Water supply & sanitation, industry, wastewater treatment, irrigation, storage. Non-OECD	Educated guess by experienced practitioner (Briscoe, 1998)	180 up to 2025; Roughly double current levels
<b>OECD 2006</b>	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
<b>David Lloyd Owen 2010</b>	Sewerage & wastewater treatment. global	Detailed country by country estimates	Increase of 40-52 (2029) on current levels of 83.5
<b>David Lloyd Owen 2011</b>	Universal coverage of safe water supply & sanitation. Non-OECD	Detailed country by country estimates	171-205 (up to 2050)
<b>Yepes, 2008 (World Bank, unpublished)</b>	Water supply, sanitation & wastewater treatment in developing countries		103 (2008-2015)
<b>WHO 2012</b>	Water supply & sanitation to meet MDGs, inc. O&M. Non-OECD	Detailed estimates	45 (up to 2015). (sanitation 23, water supply 6, O&M 16)
<b>WHO 2012</b>	Universal coverage of water supply & sanitation. Exc. O&M. Non-OECD	Detailed estimates	65 (up to 2015); sanitation 36, water supply 29.
<b>McKinsey 2013</b>	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)
<b>Booz Allen Hamilton 2007</b>	Water (unspecified). global	Regional estimates	900 (2005-2030)
<b>World Bank 2010</b>	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).

## CONCLUSIONS ON COST ESTIMATIONS

- There is little consensus in the above-mentioned studies due to differences in their subject scope (broad water or WSS), geographical coverage (global, OECD, or developing countries), time period (affecting annual averages) and methodology (top-down from % of infrastructure investment to GDP, or bottom-up from detailed compilation of national estimates).
- 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 relate to the costs in developing countries for the extension of water supply and household sanitation to provide universal coverage by 2030. The same applies to 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 - 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.
- In all cases, it is difficult to grasp the scale of future costs because of a lack of information on current spending on the items concerned. (Efforts are afoot to remedy this in respect of water supply and sanitation through the GLAAS/WHO-sponsored TrackFin programme).
- 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. On the other hand, using historical relationships excludes the potential for savings due to efficiency – which is considered to be substantial.
- Few if any of the studies allow for the impact on future costs of technological change and changing service models, or due to more efficient services<sup>15</sup>.

With these important caveats, all the studies reviewed above concur that the future financial needs from providing adequate water infrastructure across the globe will be substantially higher than what is currently being spent. A step-change is likely to be required in the amount of financing being provided.

To place the above discussion 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).

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[15] MacKinsey 2013 considers the scope for cost savings from reducing water distribution losses and improved irrigation efficiency.

## TAKING STOCK OF THE CURRENT SITUATION

How do current arrangements for financing water infrastructure measure up to future requirements, as assessed above? Are they “fit for purpose”?

First, we should acknowledge improvements and reforms that have taken place in response to **previous high-level reviews** of this topic. Finance is squarely on the agenda of international water debates, and, thanks to UNSGAB, water champions have influence with the UN Secretary-General. The OECD has run major research programmes on financing water in its various manifestations, and water governance is firmly on the work agenda of OECD, UNDP and other agencies.

IFIs have reformed their structures and product range to address recommendations to facilitate sub-sovereign finance and risk-sharing and risk mitigation for water. A number of new specialised water facilities have arisen to promote the flow of finance into rural water, transboundary schemes, “grass-roots” decentralised initiatives and other “difficult to finance” water projects.

Secondly, and reviewing international experience more widely, there are clearly water financing systems that are working well, and newer ones that look promising. From the HLP consultations for instance, in the USA there is the state revolving fund system and the widespread issue of municipal bonds based on the “tax incremental finance” system. The USA also provides epic examples of major infrastructure projects with a transformational impact on regional development, amply justifying their outlays in economic growth.

Brazil has a well functioning system for channelling pension contributions into infrastructure including water, and almost a quarter of its population is

now 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 also illustrates the active and long-sighted involvement of large public development banks as the cornerstones of strategic multi-purpose projects, and the use of local “water platforms” to provide the critical mass for funding at local and provincial level. China also exemplifies the pragmatic use of the expertise of private companies in urban water and wastewater services.

Amongst developed countries the Netherlands and France have a high degree of internal cost recovery for water (the former also having a dedicated water bank). In England and Wales private finance 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.

On a more limited scale, 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 cases of 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 Pnomh Penh utilities are among the best known cases).

These positive features are worth dwelling on, but the overall assessment of the present system of financing for water infrastructure is that it is still not up to the task described in earlier sections.

- Current spending on water is below the level required, as determined by most 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%.
- Existing water budgets tend to be underspent. In Africa according to a recent study the average actual spending of watsan budgets is only 66%.<sup>16</sup>
- Although the “traditional” sources of water finance have some potential for increase (the 3Ts including ODA, public banks, government grants, IFIs, etc) it is unlikely that they could provide the step-change in financing volume implied by most estimations.
- 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.
- The outlook is particularly uncertain for multi-purpose infrastructure. In practice, each major project is sui generis, calling for financing solutions tailored to each case. Constructing a financing package tends to be complex and time-consuming. Few financing institutions are geared up for this task. Many MPI projects are badly planned and executed, with inappropriate arrangements for procurement and risk-allocation.
- The recurrent costs of infrastructure and services (O&M) are widely under-financed, even in many OECD countries. This results in inefficient operation, malfunctioning assets, and premature obsolescence requiring wasteful early replacement and major rehabilitation. Basically, users are not paying the full cost of their water services and the water security they enjoy.
- There are too few “bankable” projects of a scale and status to attract the large volume of finance that is potentially available for infrastructure projects – from Sovereign Wealth Funds, institutional investors such as pension funds, specialised water funds, etc. This reflects underlying weaknesses of governance and commercial orientation across the water spectrum. Box I illustrates some common attitudes.

#### **Box I. 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)

“..the [water] sector’s main problem is not a financing gap, it is a credibility gap” (from one large IFI)

“..there are plenty of funds for well-structured projects” (from another major IFI)

[16] Rodriguez et.al. 2012.

## PART II. KEY ISSUES FOR DISCUSSION

This section lists a number of key issues for the HLP's consideration, with some possible responses to guide discussion. The issues are grouped into three broad categories, namely:

- How to ensure water receives its due priority in investment and financing decisions;
- How to get the best possible use of existing financial flows and sources
- How to get access to additional (and new) sources of finance.

### ONE: ENSURING WATER RECEIVES ITS DUE PRIORITY IN INVESTMENT AND FINANCING DECISIONS

**Does water get its due attention and priority in national investment programmes? If not, why and how should this be remedied?**

- Give prominence (esp. in economic & finance ministries) to evidence of impact of water infrastructure on economic growth and regional development (e.g. evidence from Global Dialogue).
- Develop a communications strategy for spreading evidence of the link from water to growth.
- Promote “stories” illustrating the above in graphic social, economic and human terms.
- In development financing institutions (e.g. IFIs, donor agencies) ensure economists and other decision makers are well informed and “on-message” when it comes to allocating resources to water in relation to other sectors in setting country strategies and sector spending targets.
- Work with NGOs, educationalists, civil society bodies & “grass-roots” organisations to create “bottom-up” pressures to get water development onto development agenda.

**How can corporate business contribute?**

- “Housekeeping”, stewardship & Footprint actions
- Wider engagement in water development in communities and regions, e.g. direct investment in, or co-funding of, projects of concern in their host regions in order to secure their resource, customer or operational base.
- Publicity and awareness-raising in corporate circles, World Economic Forum, etc.

## TWO: GETTING THE BEST POSSIBLE USE OF EXISTING FINANCIAL FLOWS AND SOURCES

### Are available sources of finance used fully and efficiently? If not, what should be done?

- It is reported that in a number of developing countries water budgets are routinely underspent; such budgets are typically devoted mainly to wages, at the expense of materials and maintenance.
- IFIs and other financing agencies struggle to fill their lending targets for water
- Governments and IFIs to allow more flexibility in the use of funds and choice of projects?

### What can be done to increase investment in multipurpose (MP) water projects?

- Improve public and political understanding of the potential social and economic benefits from these projects. Ensure their intangible benefits and their positive externalities (e.g. on health, environment, drought and flood risk mitigation) are fully reflected in the investment appraisal of these schemes.
- Identify the range of risks attached to MP projects and seek appropriate allocation of these risks amongst financing partners,

according to who can best and most efficiently accept and manage these risks. Public financing (equity capital, grants, recurrent subsidies, long term loans on concessional terms) will be required to provide the public goods<sup>17</sup> or strategic benefits expected from the MPI.

- A package of finance of different types is likely to be required, to match the financial profile of the various components of the MPI. In this context, facilities that blend different types of finance for specific projects have proven useful (e.g. the EU platforms in Africa and Latin America, and SIDA's new Grant Based Facility to Fund Infrastructure)<sup>18</sup>.
- The MPI should be structured so that cash generated by its more profitable parts (e.g. hydropower) are available to cross-subsidise unprofitable or less-profitable elements.
- Adequate funding of O&M, particularly for major structures such as dams, is essential to avoid premature breakdowns and obsolescence. Performance-Based contracts should be more widely used in this context.
- A conscious effort should be made by all those working in water, including organisers of water-themed conferences and events, to involve existing and potential financiers (particularly from commercial financial institutions) in their discussions.

[17] A public good is a good or service "...that is both non-excludable and non-rivalrous in that individuals cannot be effectively excluded from use, and where use by one individual does not reduce availability to others." (Wikipedia). These features normally mean that public provision of these items is necessary.

[18] van Ginneken (2014) advocates "...finding streamlined structures of mixing and matching various sources of financing – including Western and non-traditional financiers" in order to reduce problems that have been experienced with conventional financing models that treat hydropower in the same way as thermal projects". Van Ginneken, Meike (2014): "A decade of sustainable hydropower development- what have we learned?" A Keynote Address at the Hydrovision Conference, Nashville, USA, 22 July 2014.

## How to optimise the choice of future water infrastructure?

- Encouragement of Green Infrastructure
- Preserving options over future investment choices

## Can private water operators be part of the solution for increased efficiency? If so, how should this be done, and for which types?

- Publicise cases of successful PPPs, especially where they have a clear positive impact on poor consumers. This would help to challenge the “public finance” mindset prevalent in many countries
- Promote idea that PPPs are relevant to all levels of the value chain, including investment by small-scale business<sup>19</sup>
- Emphasise that the main contribution of private companies is typically through expertise, rather than new finance.
- More use of DBOTs<sup>20</sup> to access private expertise.
- Recognition of, and engagement with, the new “water entrepreneurs”, e.g. construction companies, companies from Brazil, China, SE Asia, etc..

## How does water governance fit in?

- Improved coordination between sectors and the promotion of synergies (e.g. through the Nexus).
- Stakeholder consultation, e.g. to determine the level of water security that is desirable and “affordable”.
- Promotion of international good practice for competitive procurement & supervision of construction & implementation.
- Continue drive against corruption which distorts the choice of projects, raises their cost, and depletes the budget for O&M. To assist this, develop and publicise data on best practices to help identify possible corrupt practices.
- Shift to using the river basin as the means of managing water resources – which ensures multi-purpose uses are properly planned, upstream-downstream conflicts of interest taken on board, and public goods and ecosystem needs are taken into account in the use of the river.
- Promotion of contractual methods giving efficiency incentives, e.g. Payment-By-Results (aka Performance Based Contracting).

[19] the World Bank’s “Tapping the markets” (2014) has a large menu of possible actions

[20] Design Build Operate Transfer concessions

## How can proper funding of recurrent costs (O&M) be achieved?

- 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 and difficulties in attracting suitable finance.
- Focussing on revenue collection is equally important as the level of tariffs. Improvement in collections – not involving 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 later tariff reforms. Pre-payment for water services is successfully used in some cities.
- Affordability can be set as a criterion for use by regulators in their oversight of water providers.
- The costs of maintenance can be minimised by data-enabled systems (as used in USA, UK and elsewhere).

## Is there an optimal allocation of risk in water infrastructure projects? What is the scope for expanding use of risk-mitigation products, such as guarantees?

- Other IFIs should emulate IBRD and IDA, which as from July 2014 have fully mainstreamed the use of guarantees into their regular financing processes.
- IFIs could target the use of partial guarantees for bond issues to where this is likely to have greatest impact.<sup>21</sup>
- IFIs should 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.

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[21] "...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 finds the resulting product more attractive". Humphrey, Christopher, Annalisa Prizzon & Cathal Long (2014, planned): A report on the use of guarantees for development (provisional title of a paper to be published by the Overseas Development Institute, London, and seen in draft by the author, p.46).



## THREE: HOW TO IMPROVE ACCESS TO ADDITIONAL (AND NEW) SOURCES OF FINANCE

### What can be done to attract more institutional investors and Sovereign Wealth Funds into water?

- Engage with institutional investors to influence the target share of water in their portfolio allocation.
- 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. 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.

### How can synergies and cooperation be developed between existing IFIs and recent or new agencies (e.g. China Development Bank, Asian Infrastructure Investment Bank, BRICS Bank, etc.)?

- IFIs should fully engage with the above-mentioned 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.

### What is the role of IFIs in funding MPI projects? How could they increase their involvement?

- IFIs have a 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 and 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 should follow a holistic approach to financing MP projects, within a framework of good governance, technology, skills development, and sustainability. (The AfDB, which targets MPI in its 10-year water Strategy, pledges to follow this approach).
- MPI should be recognised as a special asset category by financing institutions, who should adapt their professional cadre, operations and products accordingly.
- IFIs should take active steps to overcome the “compartmentalism” or “silo” mentality which can hamper the development of an MPI pipeline. (The World Bank’s newly formed Global Water Practice, which unites more than 300 of its water professionals in a single professional structure, is a step in this direction, in recognition of the cross-sectoral and multi-purpose nature of water).
- MP projects typically have more complex financing structures than single-purpose schemes. To deal with this, a Financial Solutions Unit has been set up in the World Bank, which other IFIs may need to emulate.

- Many MPI projects are of a transboundary nature, which adds to their complexity and difficulties of finance. IFIs have a vital role at the early stages of these projects, e.g. by convening Round Tables of potential financiers.
- Encourage the PPIAF<sup>22</sup> to focus on MP water infrastructure in its database and analytical work. Exemplary and successful financings of MP projects should be widely publicised.

### Is there a case for dedicated water funding agencies and facilities at international, regional or national levels?

- Development and infrastructure agencies with a balanced portfolio of assets (energy, transport, telecoms etc as well as water) can balance their risks, and develop economics of scale for building professional cadres, raising finance, etc.
- But such conglomerate bodies invariably end by marginalising water, perceived as the most “difficult” and least profitable branch of infrastructure.
- It is noteworthy that 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.
- Setting up, and making fuller use of existing, specialist water infrastructure facilities with the aim of promoting a pipeline of bankable projects (e.g. AWF, EUWF).
- Officials need to develop their skills in project finance, particularly in respect of dealings with potential financiers. In this context, donor agencies could increase their funding of training for officials in elements of project finance (as, e.g., in the Nile Basin Initiative).

### How can the funding of research & development (R&D) for water infrastructure, technology and service provision be increased?

- Water technology in its broadest sense is evolving and there are good prospects of greater efficiencies and better services in future. This calls for adequate funding at all relevant levels and stakeholders for R&D and innovation, using research grants, challenge funds, prizes, support of pilot ventures, venture capital, etc.
- The abovementioned measures would have greatest impact within an “enabling environment” where water received its proper valuation in economic and financial terms.

### How can the flow of “bankable” water projects be increased?

- Encourage IFIs and donor agencies to include support for project identification, preparation and other pre-project activities alongside 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.

### Given the increasingly urban context for water infrastructure and services, what are the best opportunities for tapping new financing sources?

- from property developers
- from property taxes (e.g. Casablanca)
- from issue of municipal bonds to fund urban infrastructure based on expected increase in local tax revenues
- from householders, for drainage, flood protection, “green” solutions, etc.

[22] Public-Private Infrastructure Advisory Facility, c/o the World Bank and IFC