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Acronyms

<i>AfDB</i>	<i>African Development Bank</i>
<i>AWF</i>	<i>African Water Facility</i>
<i>BOT</i>	<i>Build, Own, Operate contract</i>
<i>DAC</i>	<i>Development Assistance Committee (of the OECD)</i>
<i>DBOT</i>	<i>Design, Build, Operate, Transfer contract</i>
<i>DFID</i>	<i>(UK) Department for International Development</i>
<i>EDF</i>	<i>European Development Fund</i>
<i>EUWI</i>	<i>EU Water Initiative</i>
<i>GWP</i>	<i>Global Water Partnership</i>
<i>IADB</i>	<i>Interamerican Development Bank</i>
<i>IDA</i>	<i>International Development Association (of the World Bank)</i>
<i>IFC</i>	<i>International Finance Corporation</i>
<i>IFI</i>	<i>International Financial Institution</i>
<i>NGO</i>	<i>non-governmental organisation</i>
<i>O&M</i>	<i>operation and maintenance</i>
<i>OBA</i>	<i>output-based aid</i>
<i>ODA</i>	<i>official development assistance</i>
<i>PPIAF</i>	<i>Public-Private Infrastructure Advisory Facility</i>
<i>PPP</i>	<i>public-private partnership</i>
<i>PSP</i>	<i>private sector participation</i>
<i>UNICEF</i>	<i>UN Childrens' Emergency Fund</i>
<i>WHO</i>	<i>World Health Organisation</i>
<i>WSP</i>	<i>Water and Sanitation Program (of the World Bank)</i>
<i>WSS</i>	<i>water supply and sanitation</i>

EXECUTIVE SUMMARY

The “water sector” is broad and complex, but there is an important difference between the development and management of the basic resources, on which services depend, and the development of the services themselves. This paper concentrates on household water and sanitation services, and irrigation and multipurpose schemes. It is, however, important to provide adequate finance for all parts of the water spectrum in view of their inter-dependence.

In financing, the essential distinction is between basic sources of revenues (tariffs, public budgets, ODA and other philanthropic transfers) and repayable funding (loans, bonds and equity). It is important to secure a future flow of revenues through the former in order to leverage the required amounts of the latter. Various forms of facilitation are available (guarantees, subsidies, co-finance, etc.) to achieve this leverage.

Recently innovative forms of finance have evolved to support the decentralisation of services, promote the commercial viability of providers, to make funding available to sub-sovereign entities and to inject funding at the grass-roots.

Funding is essential to cover the costs of operation and maintenance (O&M) replacement, rehabilitation, modernisation and extension of water infrastructure. The cost of maintaining and repairing ageing systems is widely neglected, with the result that infrastructure is deteriorating and the quality of services is falling.

Different countries make different choices in the balance between tariff revenues, government budgets, ODA and other transfers. In general, tariffs fail to cover O&M for household WSS, though some African countries have instituted tariff reforms as part of efforts at commercialisation. The situation is worse for irrigation charges, where pricing reforms need to be part of a comprehensive set of measures to improve productivity and governance.

There are various channels through which public budgetary transfers can flow, depending on whether they are intended to cover administrative overheads, target specific categories of users, underwrite deficits of utilities, subsidise capital spending, etc. It is important for subsidy policy to be clear and logical. African Governments have committed themselves to increase their budgets for water.

ODA commitments for water are at last trending upwards, and donor agencies are taking steps to harmonise their programmes and modalities to ease the impact on recipients. Even so, the multiplicity of donors and NGOs can be a serious distraction for national administrations.

Commercial bank lending for municipal or agricultural water in Africa is normally short-term unless there are guarantees or other kinds of credit enhancement. IFI loans, especially from the World Bank and AfDB, are important, and their terms are well suited to the long term nature of this investment. Microfinance for community developments is growing, from a low level.

A few African countries have issued sovereign bonds, though there are fewer cases of municipal bond issues for water purposes, and these have relied on credit enhancement through guarantees, debt relief, etc.

Private equity has had a chequered record in African water. There have been successful concessions and lease contracts in francophone countries but elsewhere there have been few solid success stories. Likewise, PSPs in hydropower have been problematic. There is a trend in PSP for municipal water to favour lower-risk variants (e.g. management contracts, leasing) that do not expose the promoters' balance sheets. There are some interesting examples of PSP (of all types) in irrigation.

Facilitation and risk mitigation aims to reduce the main risk categories – political, regulatory/contractual, credit, foreign exchange and sub-sovereign. The mechanisms include guarantees, insurance, preferred creditor status, loan subsidies, output-based aid, convertible loans, debt-equity swaps, blended value models, challenge funds, shadow credit ratings, bond pooling, project preparation facilities, etc. The aims of these devices are, variously, to eliminate specific risks, to multiply the volume of finance, make a more attractive financing package, improve transparency, strengthen balance sheets, elicit better financial performance, reduce transactions costs, attract non-traditional sources, projectise potential earnings streams, etc.. However, guarantees and other instruments work best when they support other favourable forces – they cannot compensate for the absence of fundamentals.

The current international financial climate has created great uncertainty for all kinds of commercial funding and private equity. National budgets in many countries are also coming under great strain and borrowing is more difficult. It is difficult to predict how these forces will resolve themselves, nor what the final impact will be on water sector financing. Water agencies and service providers will need to exert themselves to take all possible housekeeping measures to reinforce their basic revenues, improve their financial viability and minimise their need for external funding until the situation improves.

Some practical steps are suggested to position African countries in the lead up to the 5th World Water Forum:

- The water community should keep the unfolding international financial situation under constant review (e.g. through the formation of a standing group or virtual network convening regularly) to consider its implications for water infrastructure, and propose mitigating measures that could limit its harmful impacts (AfDB/World Bank/WSP)
- African Governments should be encouraged to extend and deepen their financial commitments to water, specifically to make medium term (3-5 year) budgetary commitments, in return for performance contracts with water service providers (AMCOW)
- Likewise, bilateral donors should be encouraged to (continue) aligning their ODA to national needs and institutional processes, to provide the reassurance of reliability and continuity necessary for their national partners to plan and implement their water investment programmes and to leverage repayable funding (OECD/DAC, AMCOW, EUWI, etc)

- Consider forming a specifically African Panel or Task Force on Water Financing, spanning both water services and the necessary water resource development (AMCOW/AfDB, GWP, WSP, et. al.)
- Promote the concept of sustainable financing through the development of national water Financing Strategies (EUWI, OECD, WSP)
- Review the status of, and demand for, the various kinds of innovative financing mechanisms, involving public and private sector providers, NGOs, governments, and other relevant stakeholders. (AfDB, World Bank, donor agencies, banks & insurance companies, facilities)

- **Chapter 1: Basic ideas for sustainable water financing**

Compared with other infrastructure sectors, water is risky and has specific features which affect the type of finance it can attract. There is a fundamental difference between basic revenues and repayable funding sources. A number of devices or facilities exist to leverage funding from the basic revenue streams. Financial innovation often consist of diversifying the sources of finance, using non-traditional methods, and combining familiar means in unusual ways.

1.1. Defining features of water finance

The “water sector” is broad and diverse, which limits the scope for meaningful generalisation. There is a broad distinction between water *services* and water as a *resource*. Within the service sector there are important differences between household water supply, farm irrigation, industrial and power usage, navigation, and consumption by institutional users such as schools, hospitals and government offices. Even for household use there are stark differences between water supply, household sanitation, sewerage, and wastewater treatment, each with distinct financing features.

For its part, water resources is also a broad group of functions, including the development of sources, catchment management, environmental protection, multi-purpose river basin development (e.g. storage and flood control) and the many overhead functions entailed such as policy development, monitoring, regulation, research, public awareness, etc. It is important not to lose sight of the financing needs of the water sector considered as a whole.¹

To reflect the organisation of this Meeting, the paper makes a broad distinction between household water and sanitation services, on the one hand, and irrigation, hydropower and water resources management, on the other.

Certain water services (e.g. for households and farmers) lie at the boundary between *economic and social infrastructure*. Politicians and water users alike are ambivalent how far water should be treated as a basic right, to be provided free or with a subsidy, or whether it is a scarce economic product to be charged for. The result is often an uneasy compromise where water services are priced below economic levels and the sector is chronically under financed. Many water authorities exist on a financial hand-to-mouth basis reliant on infrequent and inadequate government subsidies.

The majority of water authorities in developing countries depend on public funding for their capital investment in network extensions and upgrading installations. Many do not even cover their recurrent costs of operation and maintenance through sales revenues. Raising water tariffs is a sensitive local political issue². Water providers are mostly publicly owned bureaucratic monopolies, subject to extensive political interference over staffing and operations. There are exceptions: in some developing countries public water service providers have become commercially and financially more successful.

¹ This is explored more fully in Rees *et. al.*(2008)

² This has been expressed as : “turkeys don’t vote for Christmas: mayors don’t vote for tariff increases”.

Certain other features of water services hinder access to commercial loan finance or private equity investment³:

- important benefits of water are not reflected in its price⁴;
- the infrastructure required for water supply is costly, and amortised over long periods;
- once built, it is a sunk cost with little or no alternative value;
- revenues normally accrue in local currency – which entails a devaluation risk where debt and equity have to be serviced in foreign exchange.

For all these reasons, water is a risky financial undertaking in many developing and emerging societies requiring substantial support and risk-sharing from the public sector. Compared with other networked public services, such as electricity, gas, and telecommunications, water services are capital-intensive, under-financed, less profitable and less appealing to private capital and commercial finance. They are also more heavily politicised.

Sanitation raises a different set of financing issues. Effective demand and willingness-to-pay tends to be less than for water. In peri-urban and rural situations the largest part of funding often comes from householders themselves alongside their inputs in kind. Where networked systems are required for collection (sewerage) and wastewater treatment, the major outlays required are normally met by municipalities or water authorities, with payment recovered from surcharges on water tariffs. Compared to water supply, the safe disposal of human waste and household wastewater has a larger proportion of *external social benefits*, which often justify public subsidies.

Irrigation is polarised between *surface* schemes, the larger of which are normally publicly owned and controlled, and those based on groundwater, which are normally privately owned and managed. Large surface schemes represent heavy initial investment in storage and distribution networks. Maintenance and pumping can be heavy costs for both kinds of scheme. Whereas private irrigators pay the full cost of supply (subject to any subsidy received for the pumps and for electricity) farmers on public surface schemes are normally heavily subsidised. Subsidy is justified by factors such as the promotion of food self-sufficiency, the need to settle newly developed areas, compensation for crop prices kept low for social reasons, etc.

Where the water is supplied from *multipurpose* projects, there is usually a cross-subsidy from hydropower revenues. Large hydropower projects tend to be very costly and problematic, subject to planning delays, challenges from environmental advocates, cost overruns and high levels of geological and financial risk. Governments, donor agencies and development banks tend to fund a high proportion

³ In this paper “commercial” is preferred to “private” as applied to loan finance, since much lending is from banks that are publicly owned or with a public equity holding. Also, “investment” is used in the sense of risk taking, through equity holdings. A commercial loan is not an “investment” (except in the case of a default!).

⁴ For three reasons: it is in some respects a “public good” (certain services are not profitable for private firms to supply, because they cannot exclude free-riding consumers from benefiting); it is a “merit good” (users receive benefits they don’t fully perceive, hence there is a public interest in raising general consumption); and there are external benefits - as well as disbenefits - (e.g. benefits to public health and environment).

of the capital cost of such agencies, with only a minor part by commercial lending and private equity.

1.2. Basic principles of sustainable financing

The approach followed in this paper is that there is an important distinction between basic *revenues*, on the one hand, and *repayable funding* sources, on the other. The revenues provide an assured cash flow which can be used to attract (*leverage*) funding which will be repaid from these future revenues. If basic revenues are inadequate, and likely to remain so, then loans, bonds and equity are not feasible, and cannot substitute for this basic deficiency.⁵

The three basic sources of revenue for water services are tariffs, taxation, and transfers, including ODA (the 3Ts).

Tariff revenue is the foundation of future cash flows, and will always be the main source of funding for recurrent O&M expenses. In well-managed services with a good revenue base (e.g. in sizeable urban areas) tariff revenues should contribute to investment costs too.

Tax-funded subsidies are widely used to supplement tariff revenues. They can be applied predictably and transparently – e.g. to support specific groups of deserving consumers, or as part of a performance-related agreement between the government and the utility. Or else they can be used *ex post facto* to cover operating deficits as they arise. Government grants and loans on concessional terms are also widely used to fund capital investment. Although grants are more fully transparent, “soft” loans have the merit of containing signals and incentives necessary to nudge utilities towards greater financial autonomy.

Transfers originate from external ODA plus national and international “solidarity” between citizens. “Solidarity” funds are characterized by philanthropic intent, and the use of private, non-tax sources of revenue.⁶ International solidarity from non-governmental sources provides major volumes of grant support for WSS projects. A number of large foundations are active in the area, transferring annual sums which rival those of official aid agencies. There is also a plethora of NGOs working mainly at local project levels, many with overseas links, but with others drawing on national charitable, religious and community movements.

From a longer term viewpoint, user charges are the most sustainable and predictable of the 3Ts, and fall within the control of provider agencies. Budgetary transfers can normally only be programmed several years ahead as part of government medium term expenditure frameworks, though commitments can be rolled over. The same is true of ODA., for which agreements tend to be made for 3-5 years ahead, in line with the budgets of donor agencies, though longer term commitments are possible for some of the most deserving countries. Actual annual future spending from ODA

⁵ Governments can reassure lenders and investors with sovereign guarantees or other risk-sharing methods, but these instruments imply a tax-funded subsidy, hence are part of the basic revenues.

⁶ The use of differential tariff structures and levels to cross-subsidise some consumers from others is better regarded as a tool of tariff policy, though it may have “solidarity” motives too.

commitments to WSS is, however, difficult to predict. Philanthropic transfers are even more ephemeral and difficult to programme⁷.

Sustainable Cost Recovery entails securing future cash flows from a combination of the 3Ts, and using this revenue stream as the basis for attracting repayable sources of finance – loans, bonds and equity, depending on the local situation. In a longer term perspective, the repayable sources cannot substitute for a shortage of basic revenues – they merely displace the burden to future years⁸. Even national state subsidies and ODA are performance-related to some extent, hence depend on adequate revenue flows. In the long term, tariffs underpin water finance.

Loans are of various kinds. Short term loans to cover working capital requirements and to cushion irregularities in cash flow are normally available from local banks. Medium and long term bank lending for the development of water infrastructure is uncommon in Africa, and where it arises needs government guarantees.⁹ Foreign currency lending is rarer still, and risky for the borrower. Lending from IFIs (e.g. AfDB, IFC, EIB) is more attractive since the terms, and length, of the credits are more appropriate to the cash flow of the underlying assets, though they still entail forex risk¹⁰. IDA loans are also available to poorer countries, on highly concessional terms.

Many of the loan types mentioned so far involve governments, as recipients or guarantors. If the focus shifts to local and community projects, microfinance is growing as a source of funding for projects, especially those with a short payback period.

Bond issues for municipal, agricultural or multipurpose water projects are the exception in Africa. The few cases so far have depended on credit enhancement of various kinds.¹¹ There has been some involvement of *private equity* in concessions in some West African countries, but successful projects elsewhere have been rare¹². Another potential source is *Sharia-compliant sukuk* bonds in which repayments are linked to returns on the underlying asset.

Various kinds of *facilities* exist to leverage repayable sources from the basic revenue streams (Table 1). These facilities can be viewed as bridges between cash flow and repayable funds. A number of them neutralise specific risks through various kinds of guarantees and insurance, which enables financing to take place, or improves the terms on which it is available. Many such facilities depend on subsidies, hidden or overt, from national or international public bodies, or not-for-profit actions by individuals and private companies.

Table 1. Revenues, funding sources and facilities

⁷ Except where they are secured from long term commitments by trust and foundations, or from personal covenants (e.g. tithing used by religious organisations).

⁸ Though if the use of repayable funds such as equity improves the commercial performance of water undertakings, they can increase the cash flows from which they are repaid.

⁹ COWI, (2005)

¹⁰ some agencies lend in certain local currencies, usually where they can raise bonds in the same currency.

¹¹ The Johannesburg city bonds were supported by guarantees from IFC and DBSA, and the bond in prospect for the Uganda water utility will be facilitated by Government debt-equity conversion.

¹² Kauffmann & Perard (2007)

Basic sources of revenue	Repayable funding	facilities
<ul style="list-style-type: none"> ➤ User charges (tariffs, fees) ➤ Subsidies from taxation ➤ Transfers (ODA, charitable schemes) 	<ul style="list-style-type: none"> ➤ Loans (commercial, IFI, concessional, microfinance) ➤ Bonds ➤ Equity ➤ Islamic finance (<i>sukuk</i>) 	<ul style="list-style-type: none"> ➤ Guarantees ➤ insurance ➤ B loans ➤ Loan subsidies ➤ Co-financing ➤ Output-Based Aid ➤ Convertible loans (debt-equity swaps) ➤ Social investment & blended-value models ➤ Challenge funds ➤ Shadow credit ratings ➤ Bond pooling ➤ Project preparation & development facilities

1.3. “Innovative” sources

“..there is no new thing under the Sun.”¹³

The 3Ts and the three repayable sources have long been, and are likely to remain, the foundations of water financing.

In many African countries, the financing of water infrastructure has traditionally come mainly from donor grants and concessional loans¹⁴. Overall, little use has been made of repayable sources of finance such as bank loans and bonds, while the take up of private equity has been patchy and problematic. Nor has tariff revenue been seen as a potential source of investment finance.

Against this background, any financing which lessens the relative weight of ODA and government subsidy is “innovative” even if it uses well-tried sources. In practice, much “innovative” finance consists of combining existing sources in non-traditional ways.

In one survey financial innovation is identified with sub-sovereign, decentralised, demand-responsive actions:

“Innovation in financing seeks to maximise harmonisation and collaboration by funders, to support effective decentralisation of services and decision-making and to help utilities to become commercially viable. Innovations seek ways to leverage local liquidity and to apply microfinance approaches to the sector.Innovations also help international donors to directly support devolved organisations and even in some cases local community

¹³ *Ecclesiastes* (i) v. 8.

¹⁴ 90-95% in most cases, according to consultants. See COWI (2005)

organisations...At national level, the major task is to help Governments to shift financial resources to devolved bodies to match their new responsibilities and to finance effective structures and practices that are demand responsive.”¹⁵

Chapter 2: Financing requirements

All the costs of providing water need to be properly funded – operation and maintenance, rehabilitation, modernisation, extension and replacement. Most estimates of future water costs deal only with the capital requirements for extension and rehabilitation. Maintaining existing infrastructure, which itself is growing, will absorb an increasing proportion of total finance. O&M is mainly covered by tariff revenues and budgetary transfers, whilst capital spending is financed from governments, IFI loans, ODA and commercial and private sources.

2.1. Types of cost

Much discussion of the financial cost of infrastructure development is about the capital costs of creating new water sources and systems, and extending existing networks to cope with expanding populations. Exercises to estimate the cost of the MDGs, for instance, are focussed mainly on such investment requirements. However, for infrastructure that has been in existence for some time – e.g. in many city centres – and for countries that are upgrading their service standards, the costs of rehabilitating and modernising old installations is also likely to be heavy.

Almost everywhere, maintenance of existing infrastructure is inadequate, leading to falling levels of service. This is because a lot of infrastructure is invisible, its real condition is unknown, and routine maintenance is the easiest thing in the world to “postpone” (in reality, cancel) where public budgets are under pressure. Likewise for operating budgets, which are widely under-funded – in a funding squeeze resources are concentrated on wages and salaries, leaving materials, equipment, transport and power under-provided for.

In practice, insufficient funding for O&M causes long term damage to infrastructure, which increases investment and rehabilitation costs. There is a long term trade-off between O&M and investment costs. As systems expand (see next section) O&M costs necessarily increase.

The amount and type of finance required by water services is determined by their cost structure. Centralised water distribution, as in an urban area, typically requires infrastructure with a high fixed capital cost, but a relatively low operating cost. Once the system is laid out, the overhead and capital servicing costs are high relative to the *marginal cost* of providing extra amounts. The main variable costs are energy (for pumping and treatment) and chemicals (for treatment). Once the infrastructure is in place and the number of connections determined, labour is largely an overhead cost, which does not greatly depend on the amount of water going through.

¹⁵ IRC (2007)

This cost structure requires large sums to be raised on lengthy terms for the initial investment and a tariff that contains a fixed element sufficient to cover the fixed overhead costs of supply, whatever the actual amount delivered. The tariff should ideally be volumetric, and should signal the marginal cost of increased supply. However, because clean water is a *merit good*, with social external benefits, the marginal tariff should not be so large as to discourage legitimate consumption.

All the above considerations apply with greater force to centralised wastewater collection and treatment. This is even more costly than fresh water supply, and it is vital to assure sufficient throughput of sewage to prevent accumulations in the pipes, and to ensure proper functioning of the treatment works. The wastewater tariff structure should assist cost recovery without discouraging use of the system. Broadly the same considerations apply to the management of large surface irrigation systems.

Finance tailored to these cost features would be long term, and at preferably low-interest, reflecting the capital-intensity and longevity of the assets. The fact that revenues tend to be in local currency argues for the finance to be denominated in the same currency if possible. Tariffs and other water charges should have a fixed element to cover the high fixed costs, and the volumetric part should signal the water's scarcity value and opportunity cost¹⁶, without discouraging a minimum basic level of use.

WSS for rural districts and urban peripheral and informal areas has a different cost structure. Systems tend to be smaller, more fragmented, and often based on individual households or communities. Similar considerations apply to irrigation from groundwater. A greater proportion of costs are borne by individual households, including labour and in-kind inputs. In these cases, a variety of financing sources is appropriate, including microcredit and hybrid forms including philanthropic grants.

2.2. Financial cost of achieving MDGs.

Estimates used by the UNDP indicate that the cost of sub-Saharan Africa reaching the MDGs for water and sanitation could be US\$ 7 billion annually for the final decade (equivalent to 2.7% of Africa's GDP). Existing funding sources (public budgets, cost recovery and aid) would cover only about half of this.¹⁷

A more recent and detailed estimate of MDG financial requirements has been produced by WHO authors¹⁸ for 45 sub-Saharan African countries¹⁹. The results of this study, the most comprehensive and authoritative to date, are summarised in Table 2:

Table 2. Estimated spending required in sub-Saharan Africa to increase coverage to meet water and sanitation MDGs

¹⁶ Value in its best alternative use. This is particularly important for multi-purpose schemes where there could be conflicting priorities for the use of stored water for power generation, irrigation, flood control and navigation

¹⁷ UNDP Human Development Report 2006, p. 67.

¹⁸ Guy Hutton & Jamie Bartram, *Regional and global costs of attaining the water supply and sanitation target (Target 10) of the MDGs*. WHO, 2008.

¹⁹ plus Algeria. In the WHO classifications, the countries are in AFR D and E, namely those (D) with high adult and high child mortality and (E) with very high adult, and high child mortality.

WHO sub-region	water \$ billion	Sanitation \$ billion	Water plus Sanitation \$ billion	Annual Spending	Rural as % total spending
AFR-D	5.95	15.54	21.49	2.14	60
AFR-E	5.72	18.33	24.05	2.40	70
total	11.67	33.87	45.54	4.55	

Source: Hutton & Bartram, 2008, p. 9

n.b. totals have been divided by 10 (the period between 2005 and 2014) to obtain annual sums.

The WHO study incorporates several important new elements which are crucial to the interpretation and use of estimates of this kind. The totals in Table 2 refer to the “base case” which is built up from various assumptions spelled out in the study. The authors test the results of introducing new factors and different assumptions for key variables. As coverage expands to higher proportions of the population, the cost of maintaining and upgrading the existing systems will increase. Allowing for this factor would raise the cost of water spending to \$37.14 billion, and for sanitation to \$56.97 billion, a total of \$94.11 bn – equivalent to annual spending of \$9.41 bn.. Estimates are also sensitive to the choice of technology: the cost of providing different standards of “improved” service varies, and the average unit cost depends on the relative weights of different options within the total.²⁰

2.3. water resource development, irrigation & hydropower

For a broader view, the African Water Vision 2025 contains estimates of the *annual* investment requirements of various water sector categories over the period of the scenario (Table 3):

Table 3. African Water Vision estimates of investment requirements

Water sector category	Annual investment: US\$ billion
Water supply for basic needs	5.0
Sanitation and hygiene	7.0
Irrigation & water productivity improvement	4.0
Water for industry, energy & transport	2.1
Flood and drought management	0.4
Policy & institutional reform & capacity building	0.35
Knowledge & information	0.45
Awareness & education	0.45
Research & development	0.25
Total	20.00

2.4. Matching revenues with costs

²⁰ Hutton & Bartram, 2008, p. 6. In Africa, the average per capita cost of improved water supply varies from \$164 for household connections for treated water, to \$50 for public standpipes, \$37 for a borehole and \$34 for a dug well. For sanitation, a household connection with partial treatment costs \$193 per head, a septic tank \$185, a pour-flush latrine \$147, a VIP latrine \$92, and a simple pit latrine \$63.

In this paper, no rigid distinction is made between the various cost categories (O&M, rehabilitation, investment, or overheads and variable items) from the point of view of choosing revenue and funding sources. Certain pragmatic generalisations can be made. O&M is normally covered by a combination of user charges and budgetary transfers, though in some countries the latter are supplemented by ODA and solidarity transfers. Likewise, in most African countries capital expenditure is funded from a mixture of ODA, government subventions, NGO transfers and lending from development banks. However, in well organised and commercially-oriented utilities tariff revenue can also contribute towards investment outlays.

Chapter 3: Basic revenue sources

3.1. Introduction

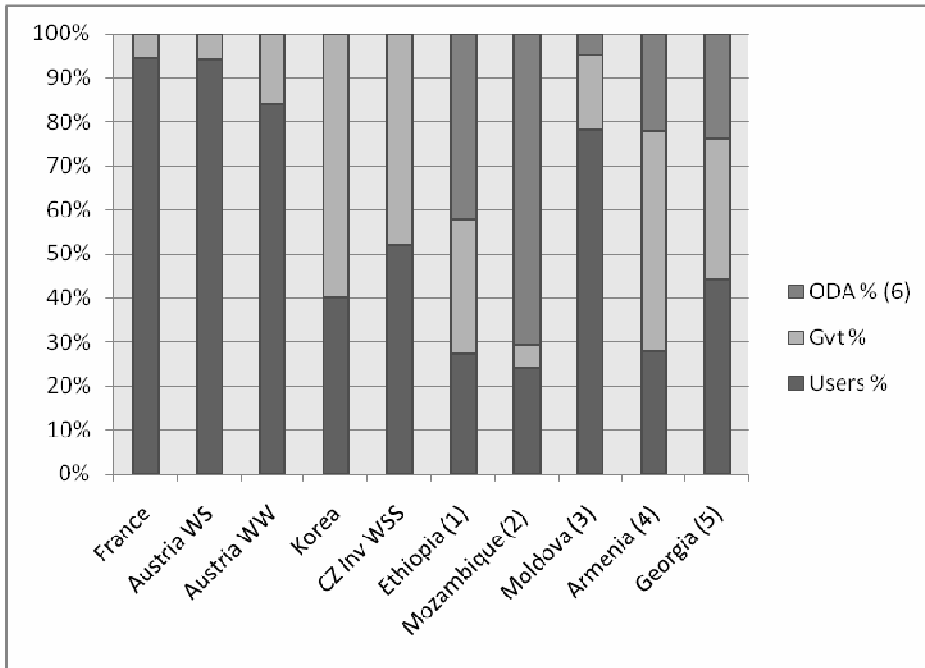
The split between the three basic sources of revenues differs between countries. Tariff revenue is still well short of covering O&M in many places. Governments have various channels through which subsidies are made to different branches of the water sector. ODA is an important source in many poorer countries, and the trend of donor commitments is at last turning upwards. National and – especially – international NGOs are major funders and large private foundations are now major players.

Different countries vary in their choices between the 3Ts – tariffs, taxation and transfers (including ODA). At one extreme, poor countries tend to draw heavily on transfers from ODA and local and international philanthropy to cover capital costs and much of recurrent costs too. At the other extreme, some developed countries with mature water systems raise all or most of their revenues from water users through tariffs, earmarked taxes and other charges.

The progression from taxes and transfers towards tariffs is not inevitable: the tradition of state finance for water using tax revenues remains strong in many countries at various stages of development. Some countries (e.g. South Africa) also have well developed internal (“solidarity”) systems for transferring resources between consumer classes, regions and municipalities with the aim of equalizing the burden of providing water services between areas of unequal wealth and size.

Although there is no clear pattern in the relative shares of the 3Ts between different countries (Figure 1), there is evidence of a diversification of financial sources for water as incomes rise and access to capital and financial markets improve.

Figure 1: Shares of ODA, national governments and users in WSS finance in various countries



(1) 2005/6; (2) rural WS 2006; (3) 2006; (4) 2005; (5) 2007; (6) Includes Official as well as non-official assistance, such as through NGOs

Source: OECD Task Team case studies and various country reports

3.2. Tariffs & charges

Although comprehensive evidence is lacking, most information points to WSS tariffs failing to cover the full costs of supply, and in many cases not even covering annual O&M outlays.

In 2004 Global Water Intelligence surveyed 132 cities in countries at all stages of development and found that 39% (and 100% of those in SE Asia and North Africa) did not even recover O&M costs. 30% of these more or less covered O&M, and 30% made some contribution to capital costs through tariffs. Even in high-income countries only 50% of utilities charged tariffs that made any contribution to their capital costs, and in developing countries the equivalent proportion was only 3%.²¹ In the late 1990s, 35 out of 49 Asian urban water utilities failed to cover O&M costs from their annual billings.²²

In Africa many of the cases where tariffs are actively used to recover some, if not all, costs of WSS involve private concessions or *affermage* contracts, e.g. **SDE** in **Senegal**. The **Uganda NWSC** is an example of a publicly owned utility which has turned itself into a successful commercially-oriented operator. As part of its reform programme, it accelerated metering, instituted tariff reform, and established the principle of indexing tariffs to annual inflation.

²¹ Global Water Intelligence September 2004

²² A, McIntosh & C.E. Yniquez *Second Water Utilities Data Book*. AsDB, 1997.

In practice, *multipurpose* water projects often cross-subsidise irrigation and other user categories out of hydropower revenues. The hydropower components of dams and water storage schemes tend to have a better financial performance than the associated irrigation projects, which often fail to recover their operating, as well as capital, costs. Thus the power element cross-subsidises irrigation and other water users, plus navigation, flood control and other public goods. In the USA such a cross subsidy was explicitly provided for in the management of the Grand Coulee Dam in the Columbia Basin, and was also a feature of the major river basin development works of the Tennessee Valley Authority.²³

There is a long economic literature pointing out the consequences of the under-pricing of *irrigation* water. The failure to fully recover costs results in poor service to users and a deteriorating infrastructure. The mounting deficits impose growing fiscal burdens on Ministries of Finance. Because farmers are not exposed to the true marginal value of their water, they lack incentives to use it carefully, or to apply it to uses with a higher water productivity. Much water is wasted in evaporation and losses. Because of the poor financial returns from public irrigation schemes, commercial lenders and external agencies have largely turned their backs on such projects. Farmers, both rich and poor, receive an economic rent from the rest of society.

However, the present – generally low or even zero – level of charges is the result of specific local social, political and economic factors. In most cases irrigation charges would need to increase to levels that are politically unfeasible in order to have serious effects on demand. More cost recovery from farmers is a desirable aim, but needs to occur within a wider and longer term framework of reform, in which farmers have more control over their supplies, greater influence over use of revenues, and a higher standard of service.²⁴

Farmers work in the face of serious market and policy failures. Measuring water use entails metering or volumetric proxies which are rarely feasible. Many empirical studies find that farmers have a price-inelastic demand at the current levels of charges, hence raising them would not create much economic incentive: whereas raising them to the level where tariffs would start to bite would be politically and socially infeasible.

3.3. national budget allocations

Transfers from public budgets to different parts of the water sector can take various forms, and have different motives. Some examples are:

- Routine allocations to cover the administrative overhead costs of central and local government bodies involved in managing water resources and services. In some cases they can be recouped from charges to users (e.g. fishing licences);

²³ *Dams and development: report of the World Commission on Dams*. 2000. p. 62-3. Also, presentation by Jerome Delli Priscoli, *Two Stories*, at the First African Water Week, Tunis, March 2008.

²⁴ F.Molle & J.Berkoff (eds.) *Irrigation water pricing: the gap between theory and practice*. IWMI/CABI, 2007

- *consumer* subsidies aimed at lowering prices charged for specific services or consumers. These include social safety nets to protect the poorest and most vulnerable water users.
- A general undertaking by the government (central or municipal) to underwrite the deficits incurred by WSS providers. This could amount to an open-ended commitment or, preferably, an explicit programme (e.g. a 5-year performance contract or the *contrats-plans* common in francophone countries) agreed between the government and service provider, containing mutual undertakings and commitments to increase tariff revenues
- Subsidies for capital expenditure. Government support for investment in the form of grants, long term subsidized loans or sovereign guarantees is widespread. It is implicit in the common pricing yardstick, that providers should initially aim to cover O&M costs, then move towards full recovery of capital charges as affordability rises.

Box 1 is a case where the national government has enunciated a clear policy towards subsidies for different types of water services.

Box 1. Subsidy policy in Uganda

For *urban water* there is in principle no subsidy, though in practice donor funds lower the cost of capital. Tariffs are intended to recover the full cost of O&M. For *small towns* a full capital subsidy is available and some subsidy is also available to operating costs through the O&M conditional grant. For *rural water supply* around 2% community contribution is expected for capital items. In principle no subsidy is offered for O&M though full cost recovery is rare in practice. For *sanitation* no subsidy is offered to households, but school toilets, public latrines and hygiene promotion are fully subsidized. For sanitation O&M no subsidy is available for households, whereas schools and promotional programmes are fully subsidized.

Source: Uganda case study for OECD Task Team

In this context, African Governments have recently made commitments to increase their spending on water (e.g. the eThekweni and Maputo Declarations).

3.4. ODA (official development assistance)²⁵ and other solidarity transfers

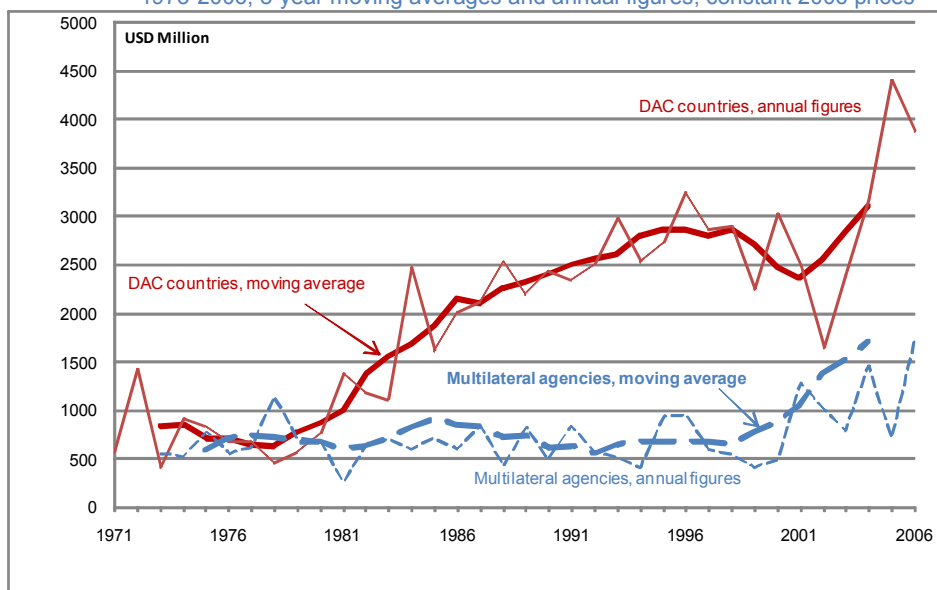
ODA provides revenue for both recurrent costs (through budgetary aid) and for capital expenditure. This section considers oda generically, and much of it applies also to the context of investment spending dealt with in the following section (3.2.)

Aid for WSS has risen since 2001 after declining in the second half of the 1990s. In 2005-6, the most recent year recorded by the OECD's DAC, the bilateral aid commitments of DAC member states to WSS were US\$5 billion, which were double the 2001-2 level in real terms. Including aid for WSS from the multilateral agencies, commitments amounted to \$6.2 billion.(Chart 1). In the latest year, DAC commitments to WSS represented 9% of their total sector allocable aid.

²⁵ All statistical data in this section is drawn from the OECD's *Creditor Reporting System: aid activities in support of water supply and sanitation, 2001-2006*.

Chart 1. Trends in ODA to water supply and sanitation

1973-2006, 5-year moving averages and annual figures, constant 2006 prices



Over the period 2001-2006, Africa accounted for 32% of DAC commitments to WSS, and sub-Saharan Africa 24%. It should be recalled that actual spending lags behind commitments; a typical WSS project takes 8 years to fully disburse, according to OECD research. In 2006 total disbursements from bilateral and multilateral aid to WSS were c. \$4.5 billion.

Most of this ODA for WSS (63%) takes the form of grants, the remainder consisting of loans with a concessional element. A number of donor agencies make their aid available through budget support, programme-based approaches, sector-wide approaches and sector programmes. Currently a high proportion of bilateral ODA for water is offered for emergency, humanitarian and post-conflict reconstruction purposes.

Not all ODA committed to “water supply and sanitation” according to the DAC’s definitions goes to WSS *services*. Around one-third in 2005-6 went to water resources protection, policy, administration and management; waste management disposal; education and training; and river development. The last item includes dams and reservoirs primarily for water supply. Infrastructure intended mainly for irrigation, hydropower and river transport is not included in the “water supply and sanitation” category and is recorded separately (Table 4). There is no clear trend in these figures.

Table 4. ODA commitments from DAC bilateral and multilateral agencies: US\$ million (rounded)

	2004	2005	2006
Water transport	416	503	304
Hydropower plants	755	480	652
Agricultural water resources	608	830	790
Total above	1,779	1,813	1,746

Source: DAC website

The decision by a national government to take up ODA being offered might seem obvious. Grant finance imposes no future repayment onus, and the burden of concessional loans arises well into the future, beyond the tenure of most elected politicians. Aid can also facilitate access to other kinds of funding. On the other hand, the bureaucratic processes associated with oda are cumbersome and it often comes with conditions that are burdensome to the recipient. Despite the laudable objectives of the Paris Declaration, administering, reporting and accounting for oda from a large number and variety of donors (and even more NGOs) can be a serious distraction for many governments and fragments the task of administration.²⁶

4. Repayable sources of funding

The three main repayable funding sources are loans, bonds and equity. Commercial banks are generally nervous of long term commitments to water. IFI loans are well-suited to water infrastructure of all types, while microfinance has great potential for smaller scale and community projects. Bond finance is in its infancy in Africa, and few municipalities presently have the capacity to raise this. Private equity, and PSP in general, has a chequered record in Africa and its future may lie in its lower-risk variants. This also applies to PSP in hydropower projects. From a low base, PSP in irrigation is growing.

4.1. Bank Loans

Bank loans for infrastructure are of two main types, depending on how risks are born. In *corporate finance* the loan is made to a company or public corporation, which undertakes the servicing of the debt. Although the loan may be used for spending on specific projects, it is the overall balance sheet of the borrower that is the concern of the lender). In *project finance* the loan is made to a “special purpose vehicle” undertaking the project, and the security for the loan is the expected cash flow from the project. Project finance is also referred to as *non-recourse* lending, because the lender cannot have recourse to the balance sheet of the sponsor in the event of a default. Bank loans are suitable to cover short- and medium-term variations in cash flow. For periods longer than this, banks would look for good liquid security, guarantees from external agencies, or recourse to the borrower’s balance sheet.

Project finance is typically used for identifiable stand-alone items such as water and wastewater treatment plants, major pipelines, large dams, etc.. The project may be implemented wholly through the public sector, or it may take the form of a public-private partnership such as a BOT (see below).²⁷ The heavy overheads on each transaction (legal & due diligence fees) implies a high minimum size per deal. Globally, project finance has not recovered the high levels of the 1990s, and in the current financial climate tends to flow to the “low hanging fruit” – robust projects in emerging markets with strong fundamentals. These are rarely in the water sector.

²⁶ According to the OECD, in 2006 38 low income countries each had 25 or more official donors working in them. Eritrea has 21 official and multilateral donors, Uganda 27, plus many more NGOs. Ethiopia is host to 7 different affiliates from Save the Children, 7 from Oxfam, and 6 from Care International. The Tanzanian civil service produces 2,400 quarterly reports on projects per year. (*The Economist*, Sept 4, 2008)

²⁷ Other variants are the Design Build Operate Transfer, Rehabilitate Operate Transfer, Transfer Operate Transfer, etc.

Local banks in Africa have provided local currency loans for infrastructure, but have typically needed substantial risk mitigation. Their main constraint (except in South Africa) is their difficulty in getting reliable funding for themselves in the long term.²⁸

Agriculture is a special case. Although farmers' needs for seasonal credit are widely catered for from a variety of sources, the situation for term finance is very different.²⁹ In many African countries there is a shortage of institutions offering term finance to farmers, apart from large commercial operators such as plantations and agro-business ventures³⁰. Box 2 illustrates a situation that is likely to be more widely typical.

Box 2. Commercial banks and agriculture in Zambia

The 15 commercial banks in Zambia currently³¹ have little relevance to financing the expansion of agriculture. This is mainly due to their high requirements for collateral and exceptionally high interest spreads above inflation. Bank deposits are mainly short term, and only the most established borrowers can expect to get long-term finance.

The main driver of the high interest rates is government spending, financed by a high level of borrowing which crowds out private borrowers. At the end of 2002 Government borrowing accounted for 82% of all commercial credit extended by commercial banks and the Bank of Zambia. The rates offered by Treasury Bills and Government Bonds represent virtually risk free investments for the commercial banks, making loans to private clients, including farmers, relatively unattractive. *The shortage of term finance is believed to be a major reason for the fact that less than 1% of the nation's cropland is irrigated.*

Source: Zambia National Farmers' Union, September 2003.

This is a serious brake on rural development, which reflects the financial markets' view of the risks in agricultural term lending, compared to financing other sectors. These risks are of different types, and are very situation-specific. Irrigation and storage facilities may actually *reduce* a farmer's risk, while financing tree crop plantations is risky. Loans to experienced farmers for machinery and equipment are not necessarily more risky than seasonal credit. Financing the expansion of existing activities is less risky than funding start-ups or diversification into new occupations. Successful providers of term finance tend to operate in areas with good infrastructure (including irrigation) and proximity to markets or processing companies.

²⁸ Sheppard *et.al.* (2006)

²⁹ Agricultural term investments have been defined as "investments in production assets used from one production cycle to another, usually over several years". Medium term finance is conventionally thought of as 1-5 years, and long-term finance more than 5 years. Term finance also includes leasing and equity.

³⁰ Recall the saying "bankers don't like lending to people they don't have lunch with"!

³¹ as of September 2003. The source is "Deliberate financing of agriculture: a proposal submitted by the Zambia National Farmers Union and the Bankers Association of Zambia to the Government and the Bank of Zambia"

Term loans normally have lower transactions costs than shorter-term credits, but repayment schedules should be tailored to the expected cash flow of borrowers. To cover against the systemic risks inherent in agriculture term lenders need a strong equity base and access to refinance facilities and risk-sharing options. Term finance is best offered in the context of relationship banking (a long-term relationship between client and bank, including a full range of products (a “one-stop shop”). Loans should be priced according to client risk, and a flexible approach taken to collateral.

IFI lending.

Medium/long term loans are available from international development banks (IFIs). Although market-related, their terms are normally more favourable than those on offer from commercial sources. IFI loans can confer prestige (the “halo effect”) on a project or borrower, which makes commercial banks more ready to co-finance (e.g. through syndications). On the other hand, IFI formalities are slower and more cumbersome than commercial lenders because of their constitutional need for more thorough appraisal and due diligence enquiries. Lending decisions may also be subject to political influence from shareholder governments and NGOs, and the loans usually carry more onerous conditions than those made by commercial lenders.

The largest IFIs lending to Africa are the World Bank/IDA and the African Development Bank Group (which comprises ordinary Bank operations, the Rural Water Supply and Sanitation Initiative and the African Water Facility). In recent years their respective commitments to African water are indicated in (Tables 5 and 6). Over the 5-year period 2003-2008 the AfDB has equalled its entire commitments for the preceding 35 years, which reflects amongst other factors the start of RWSSI.

Table 5. World Bank and IDA loan approvals for water supply, sanitation and flood protection in Africa: US\$ million. Fiscal Years (FY)

2003	2004	2005	2006	2007	2008
296	361	276	362	720	478

World Bank Annual Report, 2008-11-11

Table 6. African Development Bank Group project approvals for water supply and sanitation: US\$ million

	2003	2004	2005	2006	Est. 2007
RWSSI	36	34	231	235	267
Non-RWSSI	354	137	57	82	216
Total	390	171	288	316	483

ADF: Action Plan for Water Sector Operations, Background Paper for ADF XI Replenishment Meeting, Dar es Salaam, March 2007

Microfinance

Microfinance agencies have a role in mobilising local savings for on-lending in small amounts on terms attractive to local borrowers. Microfinance is becoming increasingly important in financing infrastructure and facilities, especially in smaller communities. Often, the work is implemented by householders themselves, and involves local small scale artisans or the informal sector.. The latest reports indicate that sub-Saharan African microfinance institutions reliant on credit from commercial banks are facing higher interest rates and greater difficulty in borrowing the funds they need.

In a well-publicised project in *Kenya*³², the World Bank is using output-based aid to provide a guarantee to K-Rep, a local commercial microfinance agency which lends to community piped water programmes. The OBA, equal to around half the loan value, is paid to the bank when the facilities have been satisfactorily built and have started to generate revenues. Up to that point, risk is borne by the bank and the borrowing community. This “guarantee” avoids moral hazard³³ by giving K-Rep Bank a positive incentive to see the projects are successfully completed on schedule.

There are a number of examples where microfinance is provided through *revolving fund* credit structures. As the name implies, as loans are repaid, the proceeds are lent out to new borrowers. The initial capital is often subscribed by IFIs or NGOs. External guarantees may also be made to cover a portion of outstanding loans, e.g. USAID’s projects described below).

In *Cote d’Ivoire* cooperation between the Government’s National Water Fund, the national water service provider (SODECI) an NGO (CREPA) and a microfinance agency has created a revolving fund structure to finance household connections in peri-urban areas of Abidjan – an effective means of scaling up services.³⁴

4.2. Bonds:

A bond (or *fixed interest security*) is a method of raising a capital sum by offering the purchaser (bondholder) the promise of repayment at a specified future date, in the meantime paying a fixed rate of interest. The bondholder can sell the security at any time (unlike a loan) provided a market exists. Movements in the market rate of interest are reflected in changes in the price of the bond³⁵. The terms of the bond (length of maturity – *tenor* – and any intermediate repayments) can be adjusted to match the expected cash flow of the issuer. Water investments typically have a lengthy payback period and predictable cash flow, which lend themselves to bond finance.

A small number of African countries have issued *sovereign* bonds of investment grade status³⁶, but this instrument is rare at municipal, still more so at utility, level. The bond issuer needs to have a good credit standing, which normally limits the use of bonds to larger and financially solvent cities. Even then credit enhancement may be necessary (see chapter 5). Due to overhead costs of the issue, there is a minimum economic size of bonds (probably \$50-100 million). Thus bonds are uneconomic for small and medium sized towns, unless they can *pool* resources with other similarly placed municipalities (which has happened recently in Tamil Nadu, India, and the Philippines, in both cases supported by a USAID partial guarantee).

³² Mehta *et.al.* (2007)

³³ an action, designed to reduce the risk of an event, which has the perverse effect of encouraging the risk of that event happening. In this case, a guarantee offered to a bank to prevent losses from bad debts, may encourage the bank to drop its lending standards and thus increase the likelihood of debt default.

³⁴ IRC (2007) p. 47

³⁵ A rise in interest rates causes a fall in the bond price and *vice versa*.

³⁶ In Sept 2006, 16 of 48 African countries had foreign currency debt ratings, but only 4 of these were of investment grade.(Sheppard *et.al.* 2006)

Sub-sovereign bodies issuing bonds are subject to scrutiny from credit rating agencies, of which the largest are Standard & Poors, Moody's and Fitch Ratings, and their local equivalents and affiliates. These agencies subject the financial status of bond issuers to rigorous and comprehensive assessment, in order to give the bond a rating, which is a key indicator used by financial markets and potential buyers. Bonds with an *investment grade* rating (BBB- or higher on the Standard & Poors scale) can legally be bought by local pension funds and other institutional investors with a fiduciary responsibility to their savers. Credit rating adds greatly to the transparency of sub-sovereign finance, permits peer comparisons, and creates a market discipline on local officials and politicians. .

Some African countries are undertaking pension reforms which could eventually provide funds for infrastructure. A precondition for attracting institutional savings would be that infrastructure bonds would need to be of investment grade, which currently implies credit enhancement (guarantees) from official or private sources³⁷.

4.3. Equity

Equity is risk capital, the return on which depends on the commercial success of the company concerned. Equity is not necessarily private – it may be issued by a publicly owned company wishing to open up its capital structure to outside interests. Equally, private equity may be held by public agencies (public enterprises, governments, publicly owned banks and financial institutions, sovereign wealth funds, etc). Although concession contracts usually involve equity finance, other forms of public-private partnerships do not, e.g. leasing and management contracts.

Equity capital can be used to partially finance

- the full or partial *divestiture* of state-owned assets, which is unusual
- the creation of a new (*greenfield* or *stand-alone*) asset such as a wastewater treatment plant or hydropower project, e.g. through a Build Operate Transfer concession contract
- *Brownfield* concession contracts for an existing network (e.g. water distribution and sewerage system) involving rehabilitation, modernisation and/or extension. These may take the form of Rehabilitate, Operate, Transfer contracts.

In such circumstances, equity is normally used in combination with loan capital and/or bond issues. The proportion between equity and loan in a balance sheet or project finance structure is the *leveraging*. The function of the equity portion is to mitigate the risk of lenders and bondholders by providing a cushion against fluctuations in income. Equity holders have no legal entitlement to dividends and have to forego returns in bad years, in the expectation of dividends in good years, and in the long run they expect to earn at least market rates of return on their investment.

The optimal balance between equity and loans/bonds depends on the specific investment and the credit standing of the investing organisation. High leveraging (a high loan to equity ratio) increases the risk to both equity holders and lenders, and raises the cost of both. Low leveraging reduces risk all round, but entails a high

³⁷ Sheppard *et.al.* 2006

average cost of capital (since the expected return on equity is normally above that of bonds to reflect the extra risk).

The record of municipal water concessions in Africa, as elsewhere, is very mixed³⁸ and the trend is towards contracts entailing lower risks to the private partner:

“In high-risk sectors such as retail water distribution in Africa, projects that once would have been implemented through brownfield³⁹ concessions are being unbundled. Private operators implement management contracts and receive compensation through a flat fee rather than from user fees. Operators issue and collect bills, fix leaks, or manage equipment. Governments and donors supply funding for capital investment and take on the demand risk associated with user payment for services. Under such an arrangement.....the government assumes most of the investment and demand risks.”⁴⁰

The successful involvement of private equity requires a fair and realistic allocation of risks between the different parties to the contract. This is particularly important for major dam projects. Many irrigation schemes depend on the construction of multi-purpose dams and reservoirs whose main revenues come from the sale of hydropower. Hydropower projects have generally not been attractive to private investors or lenders. The general principle that risk should be borne by parties best able to bear and deal with it has been the basis for PSP in major capital projects. However, recent experience in hydropower has challenged this approach. The specific risks of this sector often exceed the competence of the private contractor, and gravitate back to the public sector sponsor:

“...in many cases the expected transfer of risk from the public to the private partner does not occur, and the public sector ends up assuming most of the risks it had previously carried in order to make the project bankable.”⁴¹

Where this is likely, the implication is that the public sector sponsor should retain greater ownership and control of the project and financing should predominantly be through bonds or loans, with public or international guarantees as appropriate.

There is a long tradition of private companies and farmers developing water resources for their own use. However, the development and sale of irrigation water by private companies on an arms' length⁴² commercial basis is less common, though growing. In Africa there are examples of several kinds of private irrigation contracts. SAED (Senegal), Alaotra (Madagascar), Nakhlet (Mauritania) are cases of service contracts with fees charged to local clients. Toula (Niger) and ORMVA (Morocco) are examples of service and management contracts with fees charged directly to water users. Cases of PPP contracts involving commercial risk on private capital, with costs

³⁸ see review on Kauffmann & Perard (2007)

³⁹ broadly defined as concessions for the operation, rehabilitation and extension of *existing* assets, as opposed to “Greenfield” concessions for the creation of *new* infrastructure and facilities

⁴⁰ James Leighland, *The rise and fall of Brownfield Concessions: but some signs of recovery after a decade of decline*. PPIAF, Working Paper No 6, 2008

⁴¹ Chris Head, *Lessons from the hydropower sector*, paper in UNEP, 2004

⁴² i.e. where seller and buyer are separate legal entities, and where the price is market-determined.

recovered from users, include CSS (Senegal), Guerdane (Morocco) and the West Delta project (Egypt).⁴³

In most of the above cases the motive for PPPs was a desire by governments to reduce the level of subsidies going to operate and maintain irrigation and drainage systems. In most of the cases, farmers were organised into groups or associations. Projects in which private partners carry major commercial risk tend to have one or more of the following features:

- a state grant/subsidy or guarantee to capital investment;
- a subsidy/guarantee to operations (e.g. a “take or pay” contract in a BOT);
- supplementary revenue from water used for hydropower or water sold to other non-agricultural sectors;
- the use of water for profitable cash crops sold in urban or export markets

Morocco’s Guerdane project (Box 3) exemplifies several of the above features, namely: a substantial injection of state subsidy to reduce the tariff to affordable levels, the sale of high value-added produce in profitable markets, and the alleviation of specific risks in areas of the contract over which the concessionaire had little or no control.

Box3. Guerdane project, Morocco

The Guerdane scheme has an area of 10,000 ha. and includes 670 farmers, mainly growing citrus crops with a high value-added for the export market, with high standards of cultivation and operation. Water is currently drawn from the Souss underground aquifer using private wells. This source has been over-exploited and the water table has been falling by 2.5 metres annually, and pumping is now at depths between 90 and 200 metres. Farmers have started to abandon their groves due to exhaustion of their wells or the high cost of pumping.

To remedy this problem, the Government agency concerned (PDARE) decided to allocate 45 million m³ of surface water from two dams 40 miles upstream. This is intended to satisfy half of Guerdane’s irrigation needs, the remainder of the water being drawn as at present from underground sources. The project consists of the construction and operation of a 40-mile long water conduit and an irrigation network totalling 300 km.

The investment cost of the project is estimated to be US\$80 million. To finance this, a public-private partnership is created, with the Government providing roughly half of this amount, split evenly between a grant and a loan on concessional terms. Farmers are due to contribute c. 7% through one-off connection fees, and the concessionaire is to provide 43% of the overall cost. Bidders were asked to tender for a 30-year concession, the sole criterion for which was the price per m³ that they would accept. The winning consortium proposed a water tariff of 1.48 dirhams/m³.

⁴³ *Source:* presentations made at the Eighth International Seminar: “Emerging trends in Public-Private Partnerships in Irrigation Sector” of the International Network on Participatory Irrigation Management, Tarbes, France. May 2005. Papers available on website: www.inpim.org

The risks to the concessionaire were mitigated in several ways:

- the high proportion of total costs that were financed through grant or soft loans enabled a tariff to be set that was affordable to farmers.
- Any loss of revenue due to a shortage of water in a particular year would be largely indemnified by the Government, with the concessionaire bearing the first 15% and farmers a similar amount through a tariff surcharge.
- The tariff is in two parts, including a fixed part payable in advance. The concessionaire may deny water to any farmer who fails to pay the advance fee.

Source: Morocco Ministry of Agriculture, Rural Development and Maritime Fisheries.:

Similar risk-mitigation features are present in the Egyptian West Delta project (Box..)

Box 4. West Delta irrigation project, Egypt

The West Delta region, on the edge of the Nile Delta, contains a population of 500,000, supports 250,000 jobs, and is of great importance to Egypt's agricultural economy. All this is threatened by groundwater depletion, declining water quality and environmental degradation. In response to farmers' concerns, the Government has devised a project model that marks a break with the past, involving volumetric pricing, private participation and cost recovery.

With support from the PPIAF and the Netherlands, a project has been designed providing water to 38,000 ha of farmland over a total concession area of 75,000 ha. A Water User Council has been created to provide advice, and the concept reflects farmers' voting preferences. A surface-piped system is to replace the former open canals. Though more expensive, this will take up less land, reduce water loss through evaporation and theft, and be easier to adapt to demand. The network design is demand-driven: farmers sign connection agreements and pay security deposits before the network is built, which reduces demand risk. Farmers will pay a two-part tariff – a subscription fee based on land area and a volumetric element. Government assumes currency risk.

The World Bank is providing US\$145 million and the *Agence Francaise de Developpement* \$30 million for the 30-year Design-Build-Operate concession. The private concessionaire will provide a further 15% of the construction cost. No budgetary subsidies are envisaged. The bidding process is expected to start shortly.

Source: PPIAF website and newsletter (<http://www.ppiaf.org>)

5. Facilitation & leveraging

Repayable funding can be leveraged from the basic revenues using a variety of devices. Many of these work by mitigating specific risks, or by softening the overall

terms of financing structures. Others aim to enhance the project pipeline, improve the financial transparency of water providers, etc. These facilities have maximum impact on entities that are near the threshold of creditworthiness – they cannot succeed where the fundamentals are unsound.

5.1. Mitigating Risks

The four main categories of risk arising are:

- i) **Political:** unforeseen political events affecting the viability of the project- war, civil disturbance, terrorism, kidnappings, nationalisation, expropriation without adequate compensation, restrictions on the conversion and transfer of foreign exchange needed for the project.
- ii) **Regulatory & contractual:** Breach of contract by public offtaker, adverse decisions by regulators or other public agencies due to political pressure.
- iii) **Credit:** late payment or default on loans made, or goods and services provided, for commercial reasons
- iv) **Foreign exchange:** devaluation which increases the local currency cost of debt servicing, dividend remittances and other commitments in foreign exchange.

In recent years the following trend has been observed,

“Demand for political risk mitigation has been shifting from coverage for traditional political risks to coverage of risks arising from government actions or inactions that adversely affect the operations of a private infrastructure business – especially regulatory, devaluation and sub-sovereign risk.”⁴⁴

This implies the addition of a fifth category to the abovementioned, namely **sub-sovereign risk**. These are actions, or inactions, by subnational administrations or institutions that are increasingly responsible for providing water investments and services. In the past international finance has been channeled through central governments, who have passed on the funds to lower level agencies, or have guaranteed the latter's borrowings. The current trend amongst IFIs is to find modalities for lending against the sub-sovereign borrower's own credit risk.

Guarantees⁴⁵ work by:

- Mitigating specific risks which are the critical sticking points on a project
- Enhancing securities to take them over a critical threshold of creditworthiness
- Improving the terms on which borrowers and project sponsors can get access to loans and investment
- Giving lenders and investors exposure to previously unfamiliar capital markets and financial products

Broadly, the main sources of guarantees are: IFIs; bilateral donor agencies; bilateral official insurers; and private insurance cos. The supply situation varies between the different products as follows:

⁴⁴ Matsukawa & Habeck,(2007a). Also, Winpenny (2005)

⁴⁵ Guarantees and insurance policies are similar. Insurance policies normally pay out only after some delay during which the claim is scrutinised, whereas guarantees tend to be triggered more quickly.

Political: MIGA, other IFIs (through B loans⁴⁶), bilateral official agencies, private companies. This is a large, well established and active market, with supply well matched to demand.

Regulatory & contractual: MIGA Breach of Contract policy, World Bank Partial Risk Guarantee. Few policies have been issued so far. The product is case-specific, complicated to draw up and recovery is normally difficult. There would be strong interest from the demand side if a more homogeneous product could be developed and procedure streamlined.

Credit: Partial Credit Guarantees by IFC & other IFIs; bilateral donor Partial Loan Guarantees; insurance policies of private Monoline companies.(Box 5)

Box 5. Bond issue in Johannesburg with a Partial Credit Guarantee

IFC has provided a PCG for the rand equivalent of \$30.4 million for a 12-year domestic bond issue by the City of Johannesburg. The value of the whole bond issue is \$150 million. The issue is also supported by a local currency PCG extended by the Development Bank of Southern Africa which raises the total PCG to 40% of the total issue. The bond's proceeds are being used to fund essential investment in infrastructure, especially water, electricity and roads. Part of the bond proceeds will also be used to restructure the city's existing debt to improve its debt profile. The joint PCGs will help the city to diversify its investor base by upgrading the bond's local rating by three notches in the Fitch scale, from A- to AA-.

Source: IFC

Foreign exchange: in practice, this is not widely available from either private or official agencies. Only one case has been recorded, US OPIC in Brazil, though a proposal for a Devaluation Liquidity Backstop Facility made by the Camdessus Panel has been under study. However, the alternative of encouraging the use of local finance, by using local currency guarantees to enhance the status and rating of local borrowers and bond issuers, is starting to take off (e.g. IFC local currency PCG, and the Guarantco.⁴⁷ Another option is to index the foreign currency cost components of services to foreign exchange rates, which arrangement can then be covered through a PRG or breach of contract policy.

Insurance is similar to risk mitigation through guarantees. In return for a premium, policy holders receive indemnification for adverse events. Relevant examples are monoline insurance companies' provision of full insurance ("wraps") for municipal bonds, and insurance policies (e.g. "weather derivatives", Box 6) to improve the creditworthiness of farmers in certain countries.

⁴⁶ 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.

⁴⁷ 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

Box 6. Weather derivatives in Mexico

FIRA, an agency of the Bank of Mexico, collaborates with commercial banks in the finance of irrigation investments, which include a 50% state subsidy. FIRA offers 5-7 year investment credits, stretching to 15 years for large projects, using collateral from land and water rights (which can be bought and sold) plus machinery. FIRA offers hedging for interest rates in order to stabilize financing costs, and “weather derivatives” to offset the fall of farm incomes due to shortfalls in deliveries of irrigation water.

B loans & preferred creditor status. A number of IFIs confer preferred creditor status, which they themselves enjoy because of their public international status, on other members of their syndicated loans. The participant in a B Loan has the same “comfort” as the IFI leading the syndicate with its A loan.

Loan subsidies wrap grants into loans so as to soften the overall terms of the latter. This is a common approach of EU development assistance, where EDF grants are blended into EIB loans. ***Co-financing*** between agencies offering grants, risk capital, soft loans and/or finance on market-based terms has a similar effect in practice.

Output-based aid links disbursement to specified outcomes and is thus performance-related. In a well-known case in Kenya, OBA is combined with loans from a microfinance agency to fund community water schemes.

Convertible loans and debt-equity swaps allow the borrower an option of converting an initial loan into risk capital at a later date if circumstances change. This may result from a deterioration in the borrower’s financial prospects or, more positively, a desire to strengthen the balance sheet by increasing the equity-debt ratio, which should raise its credit standing.

Social investment & blended value models include an array of financial instruments and approaches which modify normal commercial criteria to reflect “social” returns. Private companies and banks, often in association with not-for-profit foundations, may adjust their normal commercial expectations in respect of “bottom of the pyramid” projects.

Challenge funds aim to elicit the maximum effort (best proposal, greatest local financial contribution, maximum impact per dollar, leveraging of other finance, capacity building, etc) in return for the money. Examples include the EU Water Facility and the African Water Facility. A number of private philanthropic foundations also have these aims.

Shadow credit ratings provide unofficial assessments of the credit standing of water utilities which enable them, and their financial partners, to understand their potential to raise market finance. These ratings reports can indicate areas where improvements are required. Their aim is the eventual public issue of bonds by the utility, placing it under the scrutiny of ratings agencies, which encourages transparency and good practice. The WSP has carried out a number of these shadow rating exercises. The new Water Operators Partnership for Africa has convergent aims to improve the performance of African WSS utilities.

Bond pooling is a method of overcoming the high credit risks and transactions costs of individual small municipalities by grouping them together with others, to produce a collective bond issue of a minimum threshold size. Each municipality is required to make a deposit into a collective reserve fund, which acts as the guarantee for the issue. The bond may receive further credit enhancement with the aid of external guarantees for the reserve fund, as used by the USAID's DCA in two Indian states and the Philippines.

Finally, **project preparation and development facilities** help to "projectise" potential earnings streams to attract project finance of all types. It has been observed that "...a lack of bankable, packaged projects seems to be the most critical limiting factor....A common phrase in Africa is 'too much money chasing too few projects'"⁴⁸. Such facilities variously support project identification, appraisal and due diligence, and could even extend to piloting and subsequent scaling up. There are many examples, including PPIAF, PIDG etc.

5.2. Leveraging funding from basic revenues: the potential for facilitation

The basic aim of innovative financing methods is to *leverage* more repayable funding from a given stream of basic revenues. The facilities described in the previous section are intended to increase the total volume of finance for water in various ways:

- Mitigating specific risks – making lending or investing less risky by insurance or guarantees or offering other kinds of "comfort" to financiers. This improves the terms on which borrowers and investees can receive funding;
- Wrapping grants into loans, thus multiplying the nominal volume of funds and softening the loan terms
- Combining different sources of finance (e.g. aid, equity, loans, charitable donations) into a single financial package or offer in order to make it more acceptable and affordable and to allocate risks appropriately (Box 7)

Box 7. A funding cocktail for the Kafue Basin, Zambia

The Kafue Basin in Zambia exemplifies the use of a basket of funds from all available sources. The state disburses grants to farmers through its Rural Investment Fund as part of its policy to promote food security. Government also guarantees the private funding of hydropower schemes. Costs are recovered from users through charges for the use of raw water. Communities are expected to raise at least 20% of the required investment in kind (materials and labour) and are responsible for paying O&M costs. Other capital contributions have been made by the Mwanachingwala Conservation Fund and the NWASCO Development Trust Fund, both supported by external donor agencies. For their part, NGOs provide grants, microcredit and revolving funds to farmers in this region.

Source: Report of Gurria Task Force, p. 25

- Providing greater transparency over future cash flows to provide a sounder basis for attracting repayable finance (e.g. shadow credit ratings)

⁴⁸ Leighland & Roberts (2007)

- Strengthening the balance sheets of utilities by debt forgiveness or refinancing (e.g. convertible loans, debt-equity swaps, debt relief) with the aim of improving creditworthiness.
- Smart use of oda to elicit greater financial performance from partners (e.g. challenge funds, Output Based Aid)
- Reducing the transactions costs for financings (e.g. pooling bond issues, collective guarantees).
- Leveraging financial or in-kind resources not hitherto available, e.g. microfinance based on financial and in-kind contributions of individual users and their communities
- Using project preparation and development facilities to projectise potential income streams to attract project finance

Most of these devices operate *at the margin* by alleviating a specific obstacle (risk) or by pushing a borrower/recipient over the threshold of creditworthiness or investibility⁴⁹. They cannot alter *fundamentals*, and will fail to make much difference to cases that are deficient in important areas.

Guarantees and insurance can act as a comfort, prop or stimulus⁵⁰. Many banks routinely take out political risk insurance as an extra reassurance and in order to avoid penal capital provisioning requirements. In such cases the insurance acts as a *comfort*. Foreign companies contemplating investment or operating contracts may identify the weak link as regulatory risk. A Partial Risk Guarantee could provide the missing *prop* decisive for the implementation of the project. Or a Partial Credit Guarantee could lift the borrower's credit rating above a critical threshold, at which access to the market is possible. This lowers the cost of borrowing or improves the tenor sufficiently to create a new asset class and enable the local capital market to expand. Such a guarantee acts as a *stimulus*.

Guarantees are superfluous where the activity in question would proceed without them. Others spark innovation in capital markets, or give borrowers a credit standing from which terrain they never look back. Some products shelter participants from market forces and disciplines, while others expose parties to these risks.. A 100% credit risk cover is likely to reduce the effort a lender puts into investigating the status and prospects of the borrower. On the other hand, a guarantee that raises borrowers' credit standing to the point where they enter the local market for the first time exposes them to market forces in a healthy way.

Guarantees are most successful where they have a catalytic effect, supplying the final ingredient necessary to produce a critical reaction. Countries or institutions that are at or just below creditworthiness are likely to be promising candidates for the use of guarantees.

For the guarantee to be effective, and to produce a sustainable effect, other conditions have to be present. Maximising the potential effect of guarantees depends on creating an Enabling Environment – such familiar *desiderata* as a sound legal system, law

⁴⁹ in fact, private monoline insurers will normally only guarantee borrowers or securities that already have an international investment grade rating (Matsukawa & Habeck, 2007, p. 3)

⁵⁰ Winpenny (2005) Ch 5

enforcement, a solvent banking system, honest administration, a stable macroeconomic situation, sufficient autonomy for sub-sovereign institutions, political interest and support, transparency in financial dealings, the presence of credit ratings agencies, etc. Guarantees, and many of the other risk-sharing facilities discussed here, can only go with the flow and cannot swim against the tide⁵¹.

Chapter 6: Conclusions

The key messages of this paper are recapped. Some reflections are offered on the impact on water financing of the current international financial crisis. A select number of practical suggestions are made for taking forward the issues suggested in this paper.

6.1. Key messages

- Certain peculiarities of the water sector dictate its heavy reliance on public financial support, directly and indirectly.
- Because of the risks it poses, water is the least attractive infrastructure sector for commercial finance or equity.
- There is a fundamental difference between basic revenues (from tariffs, public budgetary allocations, ODA and other solidarity transfers) and repayable funding (loans, bonds & equity). The two types are not substitutes, except in the short term.
- Sustainable financing entails securing the basic revenue flows from the various sources, and using these to leverage repayable funding according to what is necessary and feasible. Various facilities can be drawn on to bridge the two types of finance.
- Commercial debt (loans or bonds) is a feasible part of a financing package, if it can be supported by future revenues
- A long term, low interest loan in local currency available to sub-sovereign entities is a good match for the financing needs of most kinds of water infrastructure. IFI lending is well suited for infrastructure, though it is normally denominated in foreign currency.
- In addition, private involvement (PSP) in its various possible forms, including equity, is also desirable, though this depends on a realistic division of risks between the various parties, and may need external risk mitigation.
- The link between the basic revenue stream and the repayable funding sources is provided by a range of risk-sharing and other leveraging facilities. These can mitigate political, regulatory, credit and sub-sovereign risks. They can also improve the overall structure and terms of a financial offer to fit the specific project.
- The current international financial climate creates great uncertainty for all kinds of commercial and private funding, and even public budgets are not immune from the problems. In these circumstances water service providers will need to reinforce their basic revenues, and take all feasible internal “housekeeping” measures to improve their financial viability without seeking recourse to external finance.

⁵¹ Winpenny (2005) p. 103

6.2. Topical thoughts (mid-November, 2008)

The ICA Meeting takes place during a period of great international financial instability that is unprecedented in most peoples' memories. At the macroeconomic level, its impact on countries at different stages of development and in different economic circumstances is also difficult to determine. The crisis is of very recent origin, and will not fully resolve itself for some time.

Emerging markets and developing countries have been caught up in this turbulence: “As of mid-October, developing country equity markets have given up almost all of their gains since the beginning of 2008 and initial public offerings have disappeared. Spreads on sovereign bonds and commercial debt (which until recently had been the most important source of developing country finance) have risen sharply. Bank lending is also down and foreign direct investment inflows are expected to decline in the final quarter of the year.”⁵²

The repercussions on the water sector are hard to predict, but for the foreseeable future, all parts are likely to have more difficulty raising commercial and private sources of finance. This will be true even for short term bank loans. Institutional investors such as pension funds and insurance companies who have traditionally favoured long term infrastructure have seen their portfolio values reduced. Some prominent monoline bond insurance companies have experienced difficulties. Everywhere, there has been a “flight to quality” by savers and investors which will affect smaller, more recent and/or more risky borrowers. It seems that more complicated financing structures, involving credit, are more likely to be put on “hold”. Flows of remittances from workers overseas, which are important contributors to bank deposits and community and household investments, are sharply down already.

Problems in the banking and capital markets are having repercussions on exchange rates, greatly increasing the foreign exchange risk of raising money in other currencies. The US dollar is increasingly seen as a “safe haven” for internationally mobile savings. (A contrary view is that emerging markets' local currency debt is a sounder prospect at present.⁵³).

The “credit crunch” in banking should increase the demand for IFI lending, which in recent years has struggled for market share against commercial bank loans. The maturity and terms of IFI loans, alongside their other products and services, are well suited to water infrastructure.

Certain highly indebted middle-income economies have been badly affected, and have secured loans from the IMF, but the majority of the emerging markets are likely to continue growth, though at reduced rates⁵⁴. A number of these countries have large foreign exchange balances⁵⁵ and growing internal capital markets, which will provide some cushion from external shocks. Middle Eastern oil producers continue to

⁵² World Bank (2008)

⁵³ Jerome Boothe, Financial Times, 5 Nov 08, p. 42

⁵⁴ IMF, *World Economic Outlook 2008*.

⁵⁵ In August 2008 total foreign currency reserves of emerging countries was \$5,500 billion, which compares with \$260 billion available to the IMF (Martin Wolf, FT, 5 Nov 08)

accumulate large financial balances and continue the rapid development of their water infrastructure.

Developments in international commodity markets are a further test for the water sector. The “spike” in oil prices during 2008⁵⁶ is raising the energy component of water operating costs, and a number of governments have had to cap their subsidies to water, electricity and food prices for budgetary reasons. The high cost of energy has increased the cost of desalination, which is widely regarded as the “default option” in water development. Water and wastewater treatment plants, and distribution systems, are coming under greater scrutiny for their “energy footprints” and there is growing interest in creating “energy from waste” in wastewater treatment.

These developments make it more important than ever for water providers to protect and nurture their cash flows, their ultimate resort in an increasingly uncertain financial environment. If, as seems likely, all repayable sources of funding will become more difficult to obtain, institutions with weak cash flow prospects will lose out to more solvent contenders. There are many ways in which utilities and service providers can bolster their revenues which do not involve raising tariffs – though this may also be necessary. Many actions are simple “housekeeping” measures such as reducing leakage and non-accounted-for water, improving bill collection rates, reducing energy use by replacing old pumps, and other ways of reducing operating costs.

These trends affect the balance between “statist” and “market” financing solutions. As their economies have developed, some countries have relied more on internal revenue generation from user charges, less on state subsidies, and have leveraged more repayable funds as their domestic capital markets have grown⁵⁷. This is by no means a universal trend, and current financial difficulties may cause the pendulum to swing back to greater reliance on state support of various kinds (and, for the poorer countries, ODA).

Insofar as the financial crisis leads to recession in the “real” economy, there has been a revival of interest in “Keynesian” infrastructure programmes funded from public borrowing, as a counter-cyclical response. The largest historical example of this is the massive regional investment programme carried out in the 1930s by the US Tennessee Valley Authority. Then, investment in water infrastructure was seen as inseparable from development⁵⁸. Will history repeat itself?

6.3. Practical steps forward

In various recent fora, African Governments have been preparing an African position for the 2009 Fifth World Water Forum. Finance is one of the selected Themes, and within this, 3 Topics have been chosen – sustainable financing, pricing strategies, and pro-poor financing.

⁵⁶ At the time of writing this paper the price of crude oil is subsiding from its high point reached in the summer, but remains at historically high levels in real terms.

⁵⁷ The forthcoming (early 2009) report of the OECD Task Team on

⁵⁸ Refer to the presentation by Jerome Delli Priscoli, *Two Stories*, at the First African Water Week, Tunis, March 2008.

This paper has suggested a number of areas that could be further examined, and instruments and initiatives that could be reinforced in the build up to 5WWF. A range of modalities and options are available – workshops, consultancies, networking, high-level gatherings, etc., and a number of fora, partners and networks exist in which to advance this process.

- The water community should keep the unfolding international financial situation under constant review (e.g. through the formation of a standing group or virtual network convening regularly) to consider its implications for water infrastructure, and propose mitigating measures that could limit its harmful impacts (AfDB/World Bank/WSP)
- African Governments should be encouraged to extend and deepen their financial commitments to water, specifically to make medium term (3-5 year) budgetary commitments, in return for performance contracts with water service providers (AMCOW)
- Likewise, bilateral donors should be encouraged to (continue) aligning their ODA to national needs and institutional processes, to provide the reassurance of reliability and continuity necessary for their national partners to plan and implement their water investment programmes and to leverage repayable funding (OECD/DAC, AMCOW, EUWI, etc)
- Consider forming a specifically African Panel or Task Force on Water Financing, spanning both water services and the necessary water resource development (AMCOW/AfDB, GWP, WSP, et. al.)
- Promote the concept of sustainable financing through the development of national water Financing Strategies (EUWI, OECD, WSP)
- Review the status of, and demand for, the various kinds of innovative financing mechanisms, involving public and private sector providers, NGOs, governments, and other relevant stakeholders. (AfDB, World Bank, donor agencies, banks & insurance companies, facilities)

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