

# **Financing and Cost Recovery**

**Thematic Overview Paper 7**  
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**Thematic Overview Papers**



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By Rachel Cardone (ERM) and Catarina Fonseca (IRC)

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IRC International Water and Sanitation Centre

Please note that the TOPs are a web-based series. However, we feel that those who don't have access to the Internet should be able to benefit from the TOPs as well. This is why we have also made them available as paper versions.

The structure of the TOP web pages is different from that of the paper documents. We have tried to accommodate that by placing the links in footnotes of this document and also by placing information that is not part of the running text of the web version, in the annexes of this paper version.

However, you may still come across some sentences or paragraphs that seem a little strange in this paper version. If you do, then please keep in mind that the TOPs are primarily intended to be web pages.

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## Thematic Overview Papers (TOPs): an effective way to TOP up your knowledge

Do you need to get up to speed quickly on current thinking about a critical issue in the field of water, sanitation and health?

Try an IRC TOP (Thematic Overview Paper). TOPs are a new web-based initiative from IRC. They combine a concise digest of recent experiences, expert opinions and foreseeable trends with links to the most informative publications, websites and research information. Each TOP will contain enough immediate information to give a grounding in the topic concerned, with direct access to more detailed coverage of your own special interests, plus contact details of resource centres or individuals who can give local help. Reviewed by recognised experts and updated continually with new case studies, research findings, etc, the TOPs will provide water, sanitation and health professionals with a single source of the most up-to-date thinking and knowledge in the sector.

### Contents of each TOP

Each TOP consists of:

- An Overview Paper with all the latest thinking
- Case studies of best practice
- TOP Resources:
  - links to books, papers, articles
  - links to web sites with additional information
  - links to contact details for resource centres, information networks or individual experts in your region
  - a chance to feedback your own experiences or to ask questions via the Web.

To help those who have little or no access to the Internet, the TOPs will be available in hard copy format too. IRC will produce printed copies at intervals, and the website will contain a .pdf version of the most up-to-date version, so that individuals can download and print the information to share with colleagues.

The TOPs are intended as dossiers to meet the needs of water, sanitation and health professionals in the South and the North, working for national and local government, NGOs, community-based organisations, resource centres, private sector firms, UN agencies and multilateral or bilateral support agencies.

Not all the information will be of interest to everybody. The strength of the TOPs is that you can easily find the parts that matter to you. So, if you want to be up-to-date on what is happening in this important sector, don't search around aimlessly; go straight to the TOP!

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How to make the most of this TOP

IRC's Thematic Overview Papers (TOPs) aim to give their readers two kinds of help:

- Easy access to the main principles of the topic — in this case Financing and Cost recovery — based on worldwide experiences and views of leading practitioners
- Direct links to more detailed explanations and documented experiences of critical aspects of the topic on the world wide web

This TOP provides an overview on financing and cost recovery for the water supply and sanitation services sector in rural and low-income urban areas of developing countries. It gives a grounding and some specialist opinions on issues that are at the heart of efforts to meet the Millennium Development Goals of halving the proportions of people lacking access to basic water and sanitation services by 2015. Issues like these:

- Community organizations, municipalities and small service providers are failing to generate the revenues required both for capital investments to meet growing demand and for daily operation and maintenance of existing systems.
- Governments, development agencies and communities in different parts of the world are struggling with the issue of decentralization and cost recovery.
- Few countries have realistic policies, operational strategies or plans for cost recovery, let alone plans for the sustainable financing of increased service coverage over time, particularly for the poor.
- Strategies for cost recovery are typically short sighted and address only part of the issue of sustainability (for instance, focusing solely on operation and maintenance costs), and result in degradation of systems and failure to deliver reliable water supply and sanitation services.

These issues need to be addressed urgently. But how, and who will pay? And how do we ensure that poverty is properly addressed?

The TOP has been written for a wide audience and may meet different purposes for different users: policy makers, practitioners, trainers and researchers in the fields of drinking water supply but also those involved in broader programmes for the alleviation of rural poverty and specifically those struggling with financial issues at district, municipal and community level, trying to improve the lives of the poorest of the poor.

The knowledge contained here is based on the many field experiences of experts in the sector and on desk research. At every point, the TOP was designed to be as practical and useful as possible to practitioners who may be struggling with the notion of cost recovery in the water sector, and how to implement cost recovery principles into their work.

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Due to time and other constraints, this TOP focuses more on drinking water supply in rural and low-income peri-urban areas than on sanitation. Within the sector, much of the data used and issues discussed are highly controversial, which reflects many of the knowledge gaps and research challenges ahead.

Hopefully, the TOP will inspire you to advocate and put into practice some of the approaches described. As an overview it can cover only the main issues, challenges and lessons learnt on financing and cost recovery (Part I). It does, though, also include direct links to more detailed analyses of the different costs involved and how these can be recovered (Part II). And, a comprehensive list of web-based resources provides the opportunity to explore each issue in great depth (Part III). To find out what this TOP is about, read the Summary before you go into the document.

You'll find the main components of this TOP (Part I) in the menu on the right. Part I is available as web pages. It is also included in the PDF file that contains the complete document.

As you read, you will find various temptations to link to other documents with useful and more detailed advice or experiences. In most cases, the underlined link will take you first to an abstract on this website telling you more about the linked document. You may then decide whether to let your browser take you to the full reference for reading, printing or downloading.



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## Summary

### Finance and cost recovery – Decades of controversy

Cost recovery has long been a controversial issue among water supply and sanitation professionals. Throughout the 1980s – the International Drinking Water Supply and Sanitation Decade – there were two competing factions.

One side was led principally by WSS specialists in the World Health Organization and UNICEF, and backed vociferously by numerous developing country professionals and politicians, often from the rural sector. They argued that health and social benefits amply justified the use of public and donor funds to deliver basic water and sanitation services to everyone who did not have them. Part of this faction was ready to concede that funds for operation and maintenance of new systems needed to be generated locally to avoid the facilities from falling into disrepair and disuse. The more hard-line advocates of “water and sanitation for all” argued that until the unserved millions were provided with access to services, they would never be able to afford anything; provision of basic services was, they maintained, a prerequisite for income generation and poverty alleviation, which would bring with it affordability and willingness to pay.

On the other side, whose frontline advocates were economists in the World Bank, it was affordability and willingness to pay that were the prerequisites. Delivering WSS services to those unable or unwilling to meet the costs was a recipe for failure, they maintained. History taught that support from governments and donors would be phased out over the years; without external funding, systems could not be properly maintained, let alone extended to meet the demands of future generations; and communities would not value or respect facilities in which they had no stake. Subsidies could be shown to favour the rich rather than the poor. Anyway, this argument continued, the unserved poor are already paying a high proportion of their incomes either in excessive charges for poor quality water from water vendors, or in lost productivity through time taken by women to collect water from distant sources. Therefore, it went on, they would be willing and able to pay for appropriate low-cost services, if they were shown to be convenient and reliable.

Over the years, there have been many variations on the basic themes, including compromises between the two positions, particularly as the concepts of community management, stakeholder partnerships and participatory planning have evolved into sophisticated ways of achieving sustainability in a variety of fields. In the WSS sector though, arguments have persisted about the “costs” that need to be included in cost recovery strategies and the sources from which “recovery” might be considered to come.

IRC’s position on cost recovery is non-ideological and based on one single objective: to increase the numbers of poor men and women that have access to sustainable water and sanitation services. For that reason, this Thematic Overview paper (TOP) focuses on water supply and sanitation services in rural and peri-urban areas of developing countries, where

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the hundreds of millions of unserved poor people live. The TOP also introduces what we believe is an innovative approach to the issue of financing and cost recovery, by broadening the consideration of costs, benefits and revenue streams and advocating that all the linkages are clearly defined in WSS sector programming, to make the channels of cost recovery evident for the foreseeable future. There are significant challenges for governments, donors, sector agencies and many other stakeholders contributing to the achievement of sustainable WSS services for all. That is what this TOP is about.

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## PART I – What is Cost Recovery?

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## 1. What is cost recovery?

A simple definition of cost recovery for water services might read: to recover all of the costs associated with a water system, programme or service to ensure long-term sustainability (a useful definition of sustainability is provided by Brikké and shown in bullet form in box 1).

### **Box 1: Defining sustainability**

A water and sanitation service is sustainable when:

- it is functioning and being used;
- it is able to deliver an appropriate level of benefits (quality, quantity, convenience, continuity, health) to all, including the poorest women and men;
- it continues to function over a prolonged period of time (which goes beyond the life span of the original equipment);
- its management is institutionalized;
- its operation, maintenance, administrative and replacement costs are covered at the local level;
- it can be operated and maintained at local level with limited but feasible external support; and
- it does not affect the environment negatively.

*Source: Brikké (2002)*

Although this appears straightforward, various organizations, institutions and individuals with different backgrounds may interpret the definition differently.

For example, it is well understood that providing a public service such as water supply or sanitation costs money. However, among water and sanitation professionals, disagreements arise about:

Which costs are we talking about?

- Financial costs (operating costs, capital costs, cost of servicing capital);
- Economic costs/benefits (lost value of water for other uses, gains from productive use, pollution created or alleviated, ..);
- Support costs (institution building, HRD, information systems, monitoring and assessment, regulation, planning and strategy development).

How are costs recovered?

- Tariffs (fixed or variable);
- Subsidies (direct, cross subsidies, output-based subsidies);
- Overseas development assistance;
- Micro-credit;
- Social development funds
- Community funds.

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Resolving these questions is important both at the local level for services management, and also at the broader level, in discussions about current development goals such as the Millennium Development Goals for Water and Sanitation<sup>1</sup>. Because there is no clear consensus about what cost recovery is or how cost recovery reforms should be implemented, it is necessary to set out a working definition of cost recovery. This process begins with identifying what costs need to be recovered.

Existing approaches: what costs need to be recovered?

The traditional approach to cost recovery considers only the financial costs of a project or programme, such as operations and management (O&M) costs, capital costs and possibly investments for future growth and rehabilitation (which includes accounting for depreciation of assets over time). National policy then dictates whether part or all of these costs should be recovered from consumers, making tariff design and billing a crucial element in the recovery of financial costs.

A less narrow economic perspective considers, in addition to the financial costs, opportunity and environmental costs (and benefits) to society and the broader water resources environment of delivering secure water and sanitation services, in addition to the external impacts on individuals or communities. This approach allows, for example, savings on reduced health care or benefits from income-generating activities to be brought into the positive side of the equation. On the negative side, especially in water-scarce regions, it is necessary to bring in the lost industrial or agricultural production if water is allocated for WSS services. Environmental costs may arise from increased wastewater flows or from reduced water available for ecosystem maintenance, but there are also possible benefits if improved sanitation reduces water pollution.

Even full recovery of the financial costs associated with the operation and management of a system and those related with the environment does not guarantee that the system will continue to operate after it is constructed.

Neither of these approaches considers costs associated with for instance:

- developing the skills of the staff of the provincial office that has to ensure that the local water supply companies are providing a good service at an affordable price to the local communities;
- the field worker that needs to conduct willingness to pay studies;
- the availability of supply chains or technical know-how;
- the existence of financial management and accounting systems;
- the organization that is trying to make the necessary institutional arrangements to ensure that the new regulation for financing poor rural households is put into practice.

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<sup>1</sup> <http://www.un.org/millenniumgoals/>

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Financial estimates to meet Millennium Development Goal 7 – Ensure Environmental Sustainability (to halve the proportion of people without sustainable access to safe drinking water and sanitation by 2015) range from US\$8 billion per year for water supply, and US\$17 billion per year for sanitation (for a total of US\$25 billion per year) by WaterAid, to US\$17 billion for water supply by GWP. The first set of estimates considers low-cost solutions without considering replacement or financing costs; the latter set includes full water and sewage connections as well as primary wastewater treatment for urban areas. Either way, relative to other expenditures, this number is comparatively small. Selim Jahan quotes these figures for comparison: total expenditures on alcoholic drinks and cigarettes in Europe are US\$150 billion per year; agricultural subsidies in OECD countries amount to US\$327 billion per year.

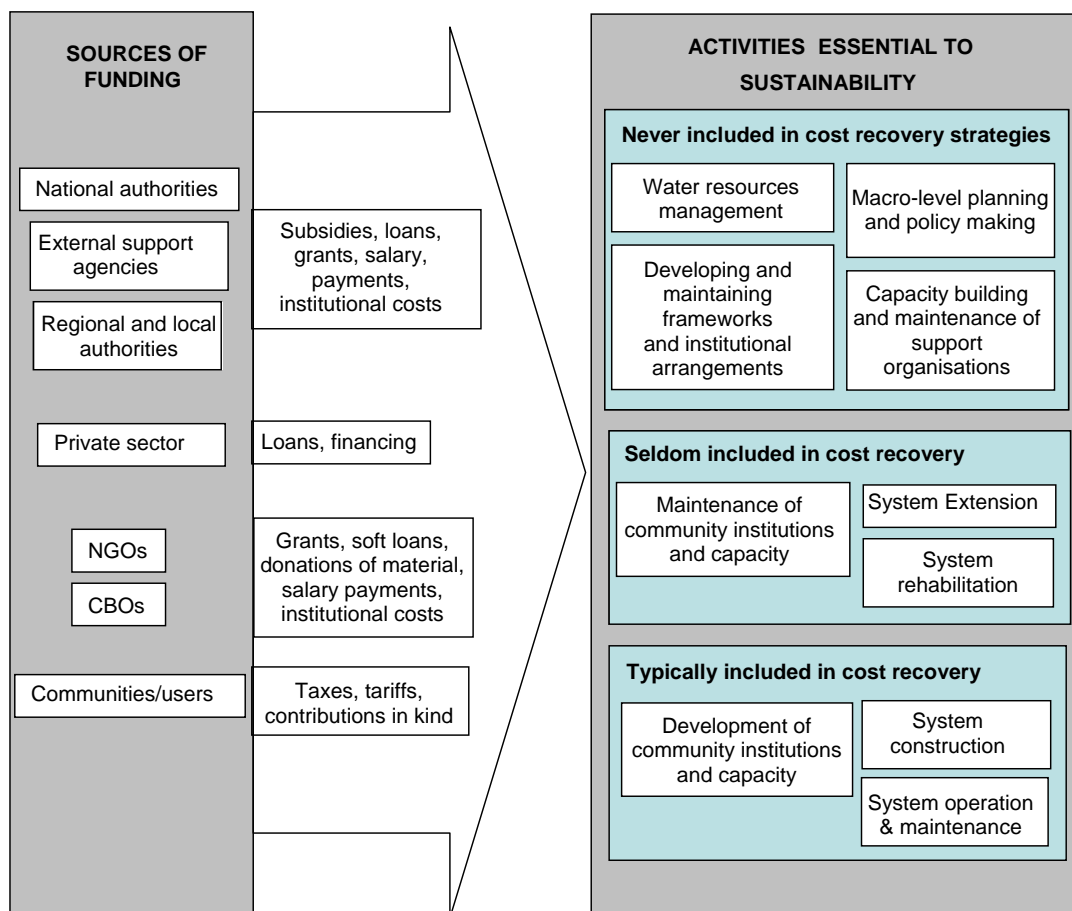
Looking beyond the amount of money that would be required to meet development targets for water supply and sanitation, a critical question remains: after the construction phase, how do we make sure that the systems keep working? How do we ensure that the existing 1.2 billion people who currently lack safe water will be able to have access to improved water services and most important of all, will have it for their children and generations to come?

#### IRC's approach to cost recovery

IRC's approach to cost recovery broadens what are usually considered financial and economic costs. It aims to look beyond the individual water system, its users and the three-year horizon of most projects or programmes financed by support agencies. It considers not only the construction, but the lifetime, rehabilitation and extension of water supply systems and all the elements that are necessary to providing longer-term support to users in poor rural communities and peri-urban neighbourhoods, while guaranteeing equitable access and use of water services taking into account opportunity and environmental costs.

In summary, IRC sees cost recovery as the matching of all costs related to providing a sustainable service, with all the available sources of funding (Figure 1). These funding sources may lie entirely with the users, but may also include external funding from governments or donors. The crucial point is that unless all of the costs related to providing and maintaining a service (technical, human resource, institutional) are identified, organized, and covered in a coherent manner with sources of funds, a system cannot be considered to be sustainable.





*Figure 1: Sustainability requires the matching of ALL costs related to providing a sustainable service, with ALL the available sources of funding*  
 Source: Fonseca (2003)

Both financial and economic approaches to cost recovery typically consider the system construction, the system maintenance, and some training to the community and local NGOs during project implementation. Often not taken into account are the system rehabilitation and extension costs as a result of population growth or increased demand for service levels and the maintenance of the existing capacities and institutions within the community.

Too often, caretakers leave their communities in search of better jobs after they have been trained, or the recently created water committee falls apart after a corruption scandal. The costs for extension staff to monitor and maintain the existing structures and capacities within the community are usually overlooked.

Most projects and programmes also rely too often on the community, local NGOs or the private sector, and do not sufficiently involve local governments during implementation.

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However, when there are serious system breakdowns or when there are conflicts within the communities and the implementing agency has left the area, some support and mediation is required from outside the community.

The costs of ensuring that the local government staff have the capacities to help the communities when systems break down or to monitor private sector performance are never included in cost calculations.

Other important elements not traditionally included in cost recovery are the costs incurred to attain a high level of skills, policy, and institutional arrangements within a local, regional, and national governance structure to determine such things as tariffs, subsidies, loans, contracts with the private sector, methods of payment, achieving poverty reduction goals and many others. These require a high level of skills, institutional arrangements, guidelines and policy making, for which costs are also never calculated.

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## 2. Why cost recovery matters

### Increase coverage

Water supply and sanitation services are known to provide economic benefits to communities in the form of health, opportunities for women (explained in this WaterAid publication<sup>2</sup>), and poverty reduction (see the TOP on Livelihoods<sup>3</sup>). Given the overall societal gains that can be achieved, it is widely accepted that water and sanitation services must be improved, especially for the poor, who are the most likely to lack access to these services (see the summary statistics from the Human Development Report in the box 2 below). But, providing water and wastewater services is not free. As a result, strategic thinking is needed about how costs can be recovered - whether from users, donors, government or others – and what costs need to be recovered to encourage sustainability.

#### **Box 2: Access denied**

- **Water:** in nine countries more than one person in four does not have access to safe water, and the situation is static or getting worse.
- **Sanitation:** in 15 countries more than one person in four does not have access to adequate sanitation and the situation is failing to improve or getting worse.

*Source: Human Development Report (2003)*

Cost recovery matters because, as Ian Johnson explains in this paper, population growth, high rates of urbanization and aging infrastructure, mean that sustaining existing water and wastewater services alone poses a daunting financial task, let alone expanding access to new communities and households, especially in peri-urban and rural areas. The numbers needing to be served to meet the Millennium Development Goals are quoted in box 3. According to the United Nation's Global Water Supply and Sanitation Assessment 2000 Report, funding limitations and inadequate cost-recovery rank as the top potential constraints to development in every region in the world.

#### **Box 3: MDG implications**

To meet the 2015 Millennium Development Goals related with water and sanitation in Africa, Asia, Latin America and the Caribbean:

- Number of people served by water supply must increase by 1.6 billion
- Number of people served with sanitation must increase by 2.2 billion

*Source: Terry & Calaguas (2003)*

Cost recovery in the water sector matters too because, although aid programmes are increasingly multi-sectoral, urgent needs for health and education, along with high debt

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<sup>2</sup> [http://www.wateraid.org.uk/site/what\\_we\\_do/the\\_need/241.asp](http://www.wateraid.org.uk/site/what_we_do/the_need/241.asp)

<sup>3</sup> <http://www.irc.nl/content/view/full/3733>

service levels within developing country governments, constrain traditional sources of funding for the sector.

Cost recovery principles matter in the context of governance, as the gaps in institutional and administrative capacity in many governments are wide, translating into less efficient planning and budgeting for the water sector. To reduce the gaps in service provision, cost recovery should – and does – play a critical role. Without cost recovery, financially strapped local authorities are unable to finance network expansions into peri-urban and rural areas, or to properly maintain the existing services.

Low service levels and poor water quality decrease the willingness of customers to pay, which in turn lowers the service level. Poor cost recovery can lead to the waste of a possibly scarce resource, an inability to maintain machinery (such as pumps), and possible health risks if people are compelled to use alternative, and often unsafe, sources of water (Figure 2).

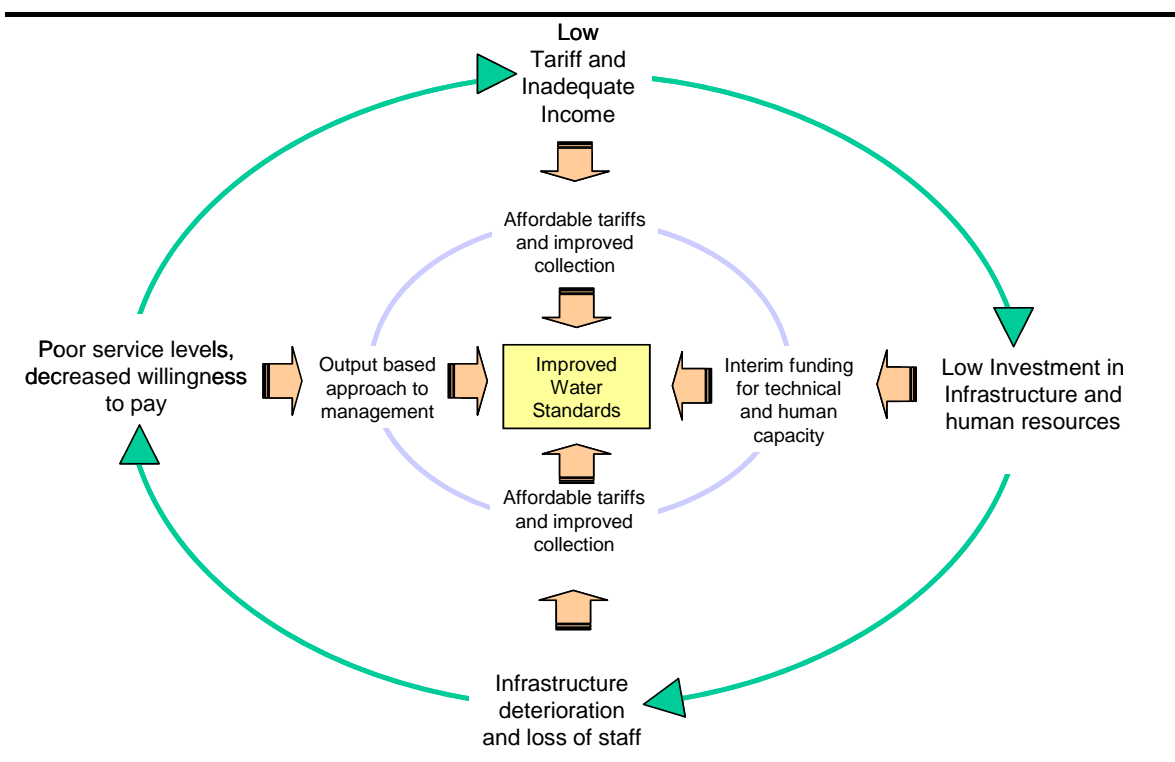


Figure 2: Cycle of water poverty and pathways to change

Source: Adapted from DFID (2001:19)

The figure shows the downward spiral resulting from poor cost recovery. In essence, low levels of cost recovery from users and other sources leads to insufficient income for the effective and efficient operation and management of the service. This implies a poor ability to invest in the sector, whether through human investment or capital investment. As a result, poor service ensues, leading to the dissatisfaction of users thus decreasing

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willingness to pay, which, on top of already poor cost recovery levels, further exacerbates the system.

### Decentralization and poverty reduction strategies

It is important to note that cost recovery is one of many tools for effective water sector reform, the impacts of which might not be effective unless it is part of broader reform efforts to address poverty (see box 4). In many developing countries, decentralization strategies – transferring administrative and financial responsibility for governance to the lowest possible level – are increasingly adopted as part of broader reform that includes poverty reduction strategies.

**Box 4: High recovery, low return**

In South Africa (as noted by the Mvula Trust’s newsletter article, “Cost Recovery at all Costs” by Martin Rall) some communities that have implemented cost recovery have noted a decline in water consumption, even while financial cost recovery rates are high. Thus, while consumers pay for a clean, piped water supply, they use very little, and have turned instead to other, poor-quality sources that are either free or at a lesser cost for the majority of their water use.

The negative public health impacts experienced in South Africa and elsewhere must be considered prior to implementing cost recovery. Otherwise, the rationale for cost recovery – to improve service levels and sustainable water systems for improved quality of life and poverty reduction – is lost.

Water reform strategies tend to parallel broader efforts, with central governments increasingly decentralising responsibilities for the water sector to the local level. This means that responsibility for service provision is devolved to a local level, while the central government maintains an oversight role with regards to policy making and regulation, as well as providing some funding. Localized decision-making bodies thus continue to gain authority for determining their own water resources development. The changes need to be consistent with poverty reduction strategies to avoid the benefits of reform accruing to those who are in less need of assistance.

For example, increasing coverage for middle-income households that are able to pay, but neglecting the poorest of the poor may have a negative impact on poverty reduction. That is because the poor are increasingly dependent on water resellers and pay on average over ten times more per litre of water than the wealthy, for a lesser quality (see box 5 for the example from Netwas’ Newsletter).

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**Box 5: It is expensive to be poor**

According to an article written by Patrick Webb and Maria Iskandarani (entitled, "The Poor Pay Much More for Water and Use Much Less, Often Contaminated", in Netwas' Newsletter, Water and Sanitation Update, 2001 (not available online) in Lima, Peru, a poor family on average pays over twenty times what a middle class family pays, even though the poor family uses (on average) one-sixth as much water as the middle class family that has a network connection.

The cost of connecting poor, peri-urban areas to a networked system is prohibitive to the poor, because these costs are generally required in a lump-sum. Hence, cost recovery strategies that address the issues of connection fees may be a viable option to improving service delivery to the poorest.

Increasing investments and recovering the costs associated with managing water supply and sanitation systems must be recognized as essential to increase coverage and to maintain and improve existing services. However, an increase in investments or revenues will only be as effective as the management structure behind it.

In the context of decentralization, and the presumed building of local and municipal capacity to support it, some of the management options these local-level bodies have to reform and strengthen the public sector for service provision include developing alternative plans such as outsourcing service provision to community-based organizations, NGOs and the private sector.

This decentralized approach to water resources and services complements the drive and rationale for cost recovery<sup>4</sup>. As local communities in rural and peri-urban areas take responsibility for their water and sanitation systems, and are no longer shielded by the bureaucracy of central planning, they have a better opportunity to identify the real local needs, the costs of providing a good quality service, and the best ways to recover the costs incurred.

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<sup>4</sup> <http://www.lboro.ac.uk/departments/cv/wedc/papers/21/groupc/semuger.pdf>  
Semogera, Fred Kato and Kiwanuka, Joseph M. 1995. "Decentralisation as a strategy for sustainability," Presented at the 21st WEDC conference, "Sustainability of Water and Sanitation Systems," Kampala, Uganda.

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### 3. Past trends and on-going challenges

#### Past trends

Historically, service costs have been widely shielded from consumers, paid for instead by donor agencies and government budgets. Because water supply and sanitation are largely considered social goods, projects and programmes have been created and implemented without serious concern for their economic sustainability.

Supplying water and providing sanitation services has an inherent financial cost not only with regards to capital investments but also during the operation and maintenance, rehabilitation and expansion phases. These financial costs are reasonably straightforward to identify and potentially match in order to recover costs. The economic costs of water – such as the impact of over-extraction and pollution – have become more widely recognized within the water community over the last decade. This acceptance of water's function as an economic as well as a social good became mainstreamed when it emerged as the fourth guiding principle of the Dublin Statement on Water and Sustainable Development<sup>5</sup> in 1992.

Many projects and programmes have tried to recover operation and maintenance costs from users, while others also include a percentage of capital costs. However, experience has shown that when funds from government and donors are cancelled or reduced, most existing community water and sanitation systems are threatened with collapse.

Against the general trend in aid flows, aid for water interventions increased during the 1990s (see *Trans-boundary Water Management as an International Public Good* pp12-13<sup>6</sup>). Large proportions came from the World Bank, the Asian Development Bank, the Inter-American Development Bank, the European Union, UNDP and UNICEF. Most of the funds were directed towards infrastructure construction while there have been some investments towards capacity building activities.

Water policy frameworks agreed at global and local-level meetings have identified the need to integrate cost recovery principles into mainstream water sector reform, and are working to address the barriers and constraints to successful implementation at the programme and system levels (see box 6 for DFID and ADB examples). But the truth remains that adequate cost recovery is still one of the major obstacles towards sustainable drinking water supply in developing countries. Government commitments to the UN Development Goals bring an obligation to ensure that basic social services such as drinking water and basic sanitation are provided.

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<sup>5</sup> <http://www.wmo.ch/web/homs/documents/english/icwedece.html>

<sup>6</sup> [http://www.ud.se/prefak/files/Water\\_Study.pdf](http://www.ud.se/prefak/files/Water_Study.pdf)



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**Box 6: Support agencies focus on cost recovery**

Both the United Kingdom Department for International Development (DFID) and the Asian Development Bank (ADB) have adopted pro-poor development as their central policy for the development agenda. At DFID, poverty reduction through sustainable livelihoods and programme-based support (rather than project-based) has become a focal point for funding, which includes a strong focus on cost recovery; the ADB has also mainstreamed demand responsive approaches to development, and is increasing involvement with NGOs that can build capacity at community level to increase cost recovery.

### On-going challenges

There are many challenges to financing and cost recovery in the water sector, including: meeting the Millennium Development Goals; designing tariffs and subsidies to target the poorest; and implementing cost recovery in a changing policy framework that is heading towards greater decentralization despite weak public sector capacity.

Figure 3 provides a list of the most common barriers to cost recovery in a ranked order that highlights the differences between the water and sanitation sectors. Notably, the top five barriers for both sectors are related to system management at community level, while the last seven barriers identified relate to institutional aspects.

Challenges to the water sector may be categorized at a general and at a water system level, although there are some overlaps. Some of the main challenges are described below. These lists are not exhaustive, but they do provide insight into the types of challenges that need to be addressed both at the broader policy level, and on a system-by-system basis.

	<b>Water</b>	<b>Sanitation</b>
<b>System management at community level</b>	1. Political interference	1. Political interference
	2. Low/variable income	2. Insufficient willingness to pay
	3. Distrust of cost collection system	3. Low/variable income
	4. Insufficient willingness to pay	4. Lack of management transparency
	5. Lack of management transparency	5. Distrust of cost collection system
<b>Institutional aspects</b>	<b>(Political interference)</b>	<b>(Political interference)</b>
	6. Inappropriate project design	6. Failure of other agencies to recover costs
	7. Failure of other agencies to recover costs	7. Inappropriate project design
	8. Expense of project	8. Cultural/religious issues
	9. Social exclusion issues	9. Social exclusion issues
	10. Land tenure issues	10. Land tenure issues
	11. Cultural/religious issues	11. Expense of project
12. Flux of population size	12. Flux of population size	

*Figure 3: Ranking of barriers to successful Cost Recovery in WATSAN*

*Source: Adapted from Waughray & Moran (2002)*

#### *General challenges – creating an enabling environment*

To get the best results in terms of the equity and sustainability of water services, there are some important ‘musts’ and some other ‘desirables’:

1. Decision makers have to be made aware of the need for and benefits of cost recovery approaches that consider not only the construction, but the lifetime, rehabilitation and extension of water supply systems and all the elements that are necessary to providing longer-term support. That support has to be provided not just for the systems themselves, but also to make the systems affordable for the poorest consumers (Review the IRC approach).
2. In a decentralization framework, the transfer of operational and financial responsibilities from central government to regional and local authorities must be accompanied by sufficient training or funding to support the new activities and skills needed.
3. Typical time horizons and priority setting for programmes (and associated funding) need to be adjusted to meet the broader, sectoral development goals – this challenge is very much directed to development agencies and development banks.

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4. Responsible agencies need to develop comprehensive national and regional budgets for the water sector that include human and technical resources as part of long-term programme design, and clarify the nature and sources of original and on-going financing.
  5. Lack of information about water consumers is often a handicap to sector planning. Gathering detailed information about a customer base can be both technically difficult and expensive in relation to the potential size and scope of water services.
  6. Specific water supply and sanitation programmes need to be part of an agreed long-term plan for water resources management within any community or set of communities sharing a watershed.
  7. Partnerships for service provision need to be developed among local NGOs, donors, governments, and the private sector, which means that there has to be a framework for fostering and coordinating such partnerships.
  8. Maintaining a focus on the poorest is vital in the context of sustainable financing and cost recovery policies.
  9. Engaging women in the decision-making process for system design and service management has been acknowledged as a challenge for some time, and continues to pose challenges in many rural and peri-urban areas.
  10. Monitoring the performance of service provision over time, to help guide strategy at the sectoral level is often a challenge, due to insufficient funding and capacity.

#### *System-related challenges*

1. High levels of unaccounted-for, or unbilled, water make cost recovery much more difficult. They can have a variety of causes, such as illegal taps, leakage, or fee waivers for larger government, industrial, or military consumers.
2. Often existing tariff structures are ineffective in capturing a system's recurring costs and promoting water conservation. They may also exclude the poorest of the poor from service provision.
3. Meters or other gauges of consumption are a critical component of cost recovery, although it should be noted that in areas with abundant supply, the cost of installing and maintaining meters may be less cost-effective. Meters must be read on a regular basis and fixed promptly when they break down. This poses technical, institutional, and financial challenges.
4. Effectively designed subsidies are targeted at the poor, to improve access to networked services in peri-urban areas, and provide access to safe quantities in rural areas.
5. Output-based tariffs and subsidies can be a challenge in a political environment that is resistant to reform and accountability of service-provider finances and accounting processes.
6. Designing a flexible billing cycle that accommodates the needs of the poor (with regards to seasonal income, non-regular income, etc.) while allowing for the service provider to maintain steady income to meet expenses can be a challenge.
7. High administrative costs can arise in billing for water, and providing information to consumers about the system.

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8. Problems can also arise where there is limited training and follow up with partners to expand expertise and encourage autonomy.
  9. Monitoring and evaluation for effectiveness at the system level is often inadequate, which means that problems are not corrected in a timely way.

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## 4. What have we learnt?

This section aims to capture different lessons about the financing of water and sanitation programmes that contribute to sustainable service delivery. Successful financing and cost recovery is a vital aspect of sustainability, and there are some common aspects that apply regardless of the management structure, geography, or size of the services under consideration.

### **Commitment from government is a pre-condition for sustainability.**

Political interference is mentioned as being an obstacle to cost recovery (*see also Komives et al, 2000*). It shows itself particularly in unwillingness to charge for water services without guaranteeing proper financing from other sources, but also in other unsustainable water policies. For example, a government might proclaim that it should provide its people with “free” water, when in fact the funding, institutional arrangements and capacities to provide that water service do not exist. This is a reality and there will always be political interference in the provision of water services because it is indeed a political issue.

While transparency and stakeholder participation can contribute to more informed political decisions, the lesson is that unless there is a real commitment from a higher level of decision making for cost recovery policies that allow access to a sustainable service to the poorest of the poor, real change cannot be expected in terms of coverage for a wider number of people.

### **Build public administrative and financial capacity, mainly at local and regional levels of governance.**

Lack of administrative, financial, and accounting skills in the public sector is a considerable obstacle to better service management, regardless of whether the public, private, or civil society is involved at the system level. With the trend towards government decentralization, the need for strong capacity building continues to grow specifically at the intermediate level (regional, district and municipality). As such, greater attention must be paid towards strengthening the skills of government staff. Long-term sustainability depends on a critical mass of trained public sector employees being retained. That means having the right incentives to retain the staff who are trained in the capacity building programmes.

### **Promote partnerships for service delivery among local authorities, local private sector water providers, local NGOs and community-based organizations.**

Partnerships between donor agencies, local NGOs, communities, local authorities, and local private sector providers have been shown to improve the effectiveness of projects in many developing countries, including Haiti, Honduras, Indonesia, and South Africa. The development of effective partnerships, as opposed to parallel and government-isolated processes, tends to be time consuming, but as a result of active communication and shared work, these initiatives also tend to be better able to face financing challenges as they arise, without threatening service sustainability.

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Besides shared financial responsibilities, partnerships can help to transfer training and skills, and, with the assistance of local NGOs and community organizations, to transfer knowledge about a community's structures and demands at a low cost to those that are not as well placed to understand local needs. Partnerships can help in replicating successful initiatives from districts to entire regions, providing increased opportunities for cross subsidies among richest-poorest regions and effectively contributing to increased coverage for the poorest.

**Willingness to pay and ability to pay for water services should be assessed and not assumed.**

Willingness and ability to pay are often assumed, based on income levels or general demographic indicators. However, there is a large and growing body of research that clearly indicates that those who are often assumed to be unwilling or unable to pay, in fact are, when provided with a range of different technological and financial options along with knowledge about the possible impacts and implications of the options and their prices. Once the expected outcome is understood, financing mechanisms can be generated to meet the outcome at a cost that is affordable to the consumers.

**Promote flexible payment structures and service levels for consumers.**

The poor in rural and peri-urban areas do not generally have steady incomes, and are often unable to pay a monthly bill in a large, lump sum. Research has shown that the poor will pay, but payment needs to reflect the consumer's special circumstances. Hence, it may be useful to allow for the possibility to pay more frequently in smaller amounts, to accommodate household income cycles. This is particularly relevant to the installation and reading of household or neighbourhood meters.

Flexible payments can be encouraged both for recurring costs and for capital costs. For example, many projects in developing countries encourage communities to contribute to capital costs not only in cash (up to 50% in some areas, but more often 10-20%, as in Latin America) but also through supplying labour and local materials. Other schemes allow consumers to pay after the harvest, when farmers are more likely to have available cash. Another option is to develop income-generating activities together at the introduction of a new water point, in order to help poorer communities be able to afford the system.

**Subsidies can be more effective if used to increase access to water supply and sanitation; for example subsidising connection fees.**

In general, subsidies should be allocated to promote access for the poor, rather than ongoing subsidies for consumption, which tend to have high administrative costs and tend to not reach the poorest of the poor. Cross subsidies should be used locally where tariffs in influential areas can support services in poorer areas. (An excellent discussion of this topic is in *Accounting for Poverty in Infrastructure Reform*, by Estache, Foster, and Quentin (2002), published by the World Bank.)

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**Promote locally based management.**

Water systems have been found to be more sustainable where central governments provide an enabling, rather than implementing role. Where local community committees or private entrepreneurs provide water services at a very localized level, systems have tended to achieve greater success in sustainability and effective cost recovery, not least because they focus on community empowerment at the design stage. Still, efforts must be made to ensure that both women and men, and the poorest are engaged in the decision making process. Specifically, women should be involved in all stages of a project cycle as well as in defining a cost recovery system best suited to the consumer's needs and community's capacities.

**Establish a source of local finance to help users pay for improved levels of service, as part of the design and implementation process.**

As part of the decentralization process, where communities' responsibilities for water services are increased, establishing a source of community finance specifically for the water sector can help lead to a system's long-term growth and viability. Common local finance mechanisms are savings clubs, micro-finance, or revolving funds (through donor agencies) for expanding and/or upgrading service levels. Local organizations that represent the poor in low-income urban areas can be used to purchase water in bulk directly from the source, and provide services at a fair price.





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## PART II – Identifying and Recovering Costs

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## 5. Identifying costs

This section expands on the summary discussion of costs in the main text, amplifying the different categories of costs. According to the IRC definition, the following costs are included:

- Financial costs;
- Economic costs;
- Costs of sustaining service (support costs).

In other words, in addition to the standard inclusion of financial and economic costs, this approach considers costs that are not usually taken into account, such as those related to:

- Institutional capacity building and skills training;
- Monitoring and assessment; and
- Policy and enabling environment.

The total costs of service delivery are summarized in figure 4.

<b>Total costs of service provision</b>		
Financial costs	Economic costs	Costs of sustaining the service
<ul style="list-style-type: none"><li>• Operation and maintenance costs</li><li>• Capital costs</li><li>• Servicing capital costs</li></ul>	<ul style="list-style-type: none"><li>• Environmental costs</li><li>• Opportunity costs</li></ul>	<ul style="list-style-type: none"><li>• Institutional capacity building and skills training</li><li>• Monitoring and assessment</li><li>• Policy and enabling environment</li></ul>

*Figure 4: Identifying Costs*

Although the ideas presented in this section are straightforward, determining the costs of each subcomponent at the project or programme level can be a big challenge. There are two main constraints:

- Inadequacy of tools or skills for collecting data on needs and use of drinking water and on the real costs of service provision; and
- Inadequate and complex accounting systems at the country level with no common minimum standard among regions.

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## Financial costs

Financial costs are the most tangible, because they arise directly from the construction, maintenance and use of water and sanitation facilities. These costs must generally be identified in order to arrange for financing, or to account for loans and grants either from external sources or from central government. They include, but are not limited to:

- Construction costs
- Operations and maintenance;
- Replacement, refurbishment and rehabilitation costs;
- New customer connections;
- Depreciation; and
- Cost of capital invested.

A useful way to consider financial costs is to group them into three main categories:

- Operating costs
- Capital costs;
- Costs of servicing capital (the return on capital for the lender).

These categories apply to both large and small-scale systems in developing countries, although different types of systems may have different associated costs. A general overview of typical costs that might fit into each category is provided in Figure 5.

The types of costs that need to be taken into account on a simple handpump project are illustrated in example 1 in the Annexes. A more complex example, involving a river intake, water treatment and distribution system, is detailed in example 2 in the Annexes.

<b>Operating costs</b>		
Water supply and sanitation	Water supply specific	Sanitation specific
<ul style="list-style-type: none"> <li>• Employment</li> <li>• Power costs</li> <li>• Cost of materials</li> <li>• Hired &amp; contracted</li> <li>• Support costs</li> <li>• Other costs</li> </ul>	<ul style="list-style-type: none"> <li>• Water source protection and conservation</li> <li>• Water treatment</li> <li>• Water distribution</li> </ul>	<ul style="list-style-type: none"> <li>• Sewage treatment</li> </ul>

<b>Capital costs</b>		
Water supply & sanitation	Water supply specific	Sanitation specific
<ul style="list-style-type: none"> <li>• Offices, depots and warehouses</li> <li>• Land for protecting water quality</li> <li>• Boreholes</li> <li>• Non-operational plant machinery</li> <li>• Future investment costs for major rehabilitation, replacement and extension</li> </ul>	<ul style="list-style-type: none"> <li>• Water resources facilities</li> <li>• Water distribution mains</li> <li>• Pumping stations</li> <li>• Water treatment works</li> </ul>	<ul style="list-style-type: none"> <li>• Sewage treatment</li> <li>• Sludge treatment works</li> <li>• Pumping stations</li> </ul>

<b>Cost of servicing capital</b>		
Water supply & sanitation	Water supply specific	Sanitation specific
<ul style="list-style-type: none"> <li>• Cost of interest repayments on a loan</li> <li>• Impact of amortization and depreciation</li> <li>• Exchange rate variations</li> <li>• Inflation</li> <li>• Bank fees</li> </ul>		

*Figure 5: Grouping of Financial Costs*

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### *Operating Costs*

Operating costs are recurrent, in that they are continuous over time and are a part of the operation and maintenance of a water supply or sanitation system. This includes:

- employment (e.g., staff involved in operation, maintenance, routine preventive maintenance, repairs, and construction for minor rehabilitation)
- cost of power (electricity connections plus usage fees), materials (such as chemicals for treatment, tools, spare parts, equipment, and administrative supplies), cost of hiring and contracting services, for drilling or billing, etc.;
- support costs (such as transport costs, training support, technical assistance);
- other costs, such as unaccounted for water due to leakage in the system, poor administration, or vandalism.

Operating costs also include the cost of maintaining water pumping stations and water distribution systems, as well as sewage pumping stations and sludge treatment/sewage works. Operating costs are generally identified through the budgeting process, whether for a service provider or for the government. In countries with strong water sectors, operating costs are identified and estimated through a broader planning and development cycle, and are used as the basis for determining tariff levels or the need for additional sources of finance in order to meet the system's needs. The effects of technology choice on operating costs and the implications for community awareness raising are discussed further in box 7.

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**Box 7: Importance of technology choice**

Choice of technology for service provision has a definite impact on the level of future operation and maintenance (O&M) costs and is key for service sustainability. If a community actively chooses a technology at a known price and agrees to manage the system, it also tends to invest in both maintaining and improving performance.

Communities and local authorities and/or the private sector should be made aware of the financial implications of operating, maintaining, managing, rehabilitating and replacing a given technology. Hence, during technology choice priority should not necessarily be given to systematically minimizing investment costs, but also in analysing O&M costs that communities can afford and are willing to pay.

Communities should also be made aware about ways to optimize or minimize costs related with the technology used such as:

Economies of scale;

- Reduction of dependence on energy and chemicals;
- Monitoring changes in fixed and variable costs;
- Improving preventive maintenance and therefore fostering a “maintenance culture” within a community;
- Installing a systematic leakage control system;
- Developing an effective financial control mechanism.

Locally-based supply chains can help to keep the cost of spare parts and other supplies – and therefore maintenance – at affordable levels, while at the same time providing employment opportunities within communities. In Pakistan, the development of local supply chains for the Afridev handpump has transformed the rural water supply and sanitation sector, such that the handpumps are locally manufactured in three out of the country's four provinces. This example is explained in more details by the Water and Sanitation Program (read more at [http://www.wsp.org/pdfs/sa\\_afridev.pdf](http://www.wsp.org/pdfs/sa_afridev.pdf))

If capacity building activities are too complex to organize for a given technology, it may well be necessary to consider another technology that will require less management skills. Appropriate financial management capacity and skills are necessary to run a service efficiently, and all aspects linked to bookkeeping, budget setting, billing, revenue collection, recording expenses/ revenues, monitoring, and applying sanctions have to be in place. An assessment of the management capacity of the community or local authority managing the system is therefore crucial.

If capacity building activities are too complex to organize for a given technology, it may well be necessary to consider another technology that will require less management skills.



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### *Capital Costs*

Capital costs include the costs involved in ensuring that all the assets of a water supply or sanitation system – both buildings and water supply systems such as boreholes and infrastructure – are sustainable over time. This includes ensuring that the land around a water supply source is adequately protected for quality purposes. It means making sure that funds are available for expanding if necessary into new areas, for future investments, and for rehabilitating and restoring equipment such as pumping stations, water and sewage works, and non-operational plant machinery when it needs repair.

### *Cost of Servicing Capital*

This category refers to the cost of accessing capital to finance debt. It includes interest payments on debt, the structure of amortization as it relates to depreciation, the stability of local currency, which is particularly necessary if the loan is not in local currency, associated bank fees, and the level of inflation at a macro-economic level. These costs, while not directly related to the tangible assets of a water supply and sanitation system, are important to the financial strength of service provision.

### Economic costs

Economic costs (Figure 6) reflect the value of water in a broader framework, beyond a project or programme, for example at a watershed level. The goal of economic analysis is to consider the impact of decisions regarding resource allocation (both financially and with regards to the water resource) on individuals, society, and the environment. Different types of users must share the resources not only for water supply and sanitation, but also for other purposes such as agriculture, industry, recreation, and ecosystem stability.

<b>Environmental costs</b>		
<b>Water supply &amp; sanitation</b>	<b>Water supply specific</b>	<b>Sanitation specific</b>
<ul style="list-style-type: none"><li>• Pollution from diesel pumps</li><li>• Ecologic costs due to insufficient allocation and pollution from insufficient treatment</li></ul>	<ul style="list-style-type: none"><li>• Over-abstraction of groundwater aquifers</li><li>• Costs of treating water supply due to contamination from industry and other sources</li></ul>	<ul style="list-style-type: none"><li>• Impact on environment due to insufficient wastewater treatment</li><li>• Public health costs due to insufficient wastewater treatment</li></ul>

<b>Opportunity costs</b>		
Water supply & sanitation	Water supply specific	Sanitation specific
	<ul style="list-style-type: none"> <li>• Productive uses of water</li> <li>• Time saved in water collection for education or other activities</li> </ul>	<ul style="list-style-type: none"> <li>• Lost wages due to poor health</li> <li>• Safety considerations due to cultural factors</li> </ul>

Figure 6: Grouping of Economic Costs

Competing water uses increase demand in a river basin or watershed. Where supplies are limited, the users must prioritize and decide how the water will be allocated. The economic cost of a particular allocation reflects the values of the decision-makers, in relation to other values, or options. This type of cost may not always have a concrete financial cost equivalent, which often makes it hard to identify in a tangible way. In a sense, value for a particular decision may refer to intangibles things such as long-term security, poverty alleviation, religious beliefs, and environmental and quality regulations, as well as financial values. Some of the key tradeoffs in understanding economic costs are illustrated in these examples (see Annexes with examples 3 to 6):

- Costs of water pollution in China;
- Land subsidence in Mexico;
- Valuing time saved in water collection;
- Productive uses of water.

Economic costs are also not commonly considered when calculating tariffs, with the exception of those costs associated with water conservation in areas where water is scarce, or specific charges for certain uses to correct environmental damage.

Economic costs are really more useful for priority setting, and although they are difficult to measure and to translate into monetary values, ignoring many of the indirect benefits may lead to a serious underestimation of the overall benefits for poverty alleviation of rural water supply schemes. Taking economic costs into account can contribute to an increased effectiveness of many investments in the sector.

For a full economic cost-benefit analysis “quick course” illustrated with several examples, follow this link<sup>7</sup>.

### Support costs

While financial costs are perhaps the most transparent – in that a figure or amount can be identified for each specific output or outcome, in many developing countries, the costs of sustaining the service over the long term is often overlooked. Figure 7 shows the types of costs that are included in this category.

<sup>7</sup> [http://www.adb.org/documents/handbooks/water\\_supply\\_projects/Chap6-r6.PDF](http://www.adb.org/documents/handbooks/water_supply_projects/Chap6-r6.PDF)

<b>Cost of support</b>
<b>Water supply and Sanitation</b>
<ul style="list-style-type: none"> <li>• Institutional capacity building and skills training at the community, local government and national government levels</li> <li>• Development and maintaining monitoring and assessment information systems</li> <li>• Development and maintaining water and wastewater management and development plan</li> <li>• Ongoing development, refining and implementation of policy</li> <li>• Regulation at the national and local levels</li> </ul>

*Figure 7: Grouping of Support Costs*

Support costs include institutional capacity building and skills training at local, regional, and national levels, and also include built-in incentives to prevent a local “brain drain” once technical and administrative staff are trained – and until a critical mass of people is trained. This category also includes the cost of developing and maintaining monitoring and assessment information systems (box 8) which are critical for gauging the effectiveness of programmes as part of a broader development strategy.

**Box 8: Data collection for monitoring and assessment**

In many developing countries, there are no data about financial expenditures or processes to project future expenditures. Data that are collected tend to be for a singular purpose, whether for a census conducted every decade, or as a prerequisite for donor funding, rather than as part of a regular reporting and monitoring system.

Increasingly, awareness is growing about the need for improved data and cost-effective monitoring and assessment mechanisms, particularly as part of the process to meet the Millennium Development Goals. As such, the identification of costs has become part of ongoing development processes, such as the Poverty Reduction Strategy Papers and Credits (PRSPs and PRSCs, respectively), and Medium Term Expenditure Frameworks (MTEFs). Data collection and storage mechanisms are slowly being developed as part of capacity building for local government.

Likewise, the costs of developing a strategy for water resources and wastewater management, including the strengthening of regulatory mechanisms to implement policies and plans, should all be recognized as part of the total cost of providing sustainable water supply and sanitation services. This is not to say that the burden of these costs should be shouldered entirely by users. Rather, within a framework of cost recovery, these costs should be acknowledged and understood as important within the broader context of reform.

**Planning for Financing and Cost Recovery**

Cost recovery at both the project and the programme levels contributes to sustainability, and planning for it requires an appropriate strategy. Indeed, it will help to define

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orientations and processes, as well as determine a structure upon which the management of a service will operate in a short and long term perspective. In most cases, setting a strategy for cost recovery starts with asking key questions such as:

- What is the role of the communities in cost recovery?
- How can the social dimension be integrated into cost-recovery strategies?
- What costs should be recovered, and how?
- How can sustainability objectives be incorporated?

WSS programmes in rural and peri-urban areas increasingly incorporate demand-responsive approaches (see annex) into water sector development, which inherently includes a determination of a community's values for water's environmental, social, and economic uses.

Although a current tendency is to promote thinking that communities should pay all of the costs related with operating and maintaining a drinking water supply scheme and a certain percentage of capital costs, in many communities tariffs alone are not sufficient - and will not be sufficient in the near term - to cover all of the costs, and many households cannot pay some tariff levels.

The following questions can be used as a starting point with the community, the private sector and local authorities and should preferably result in a mutual agreement:

- Should only basic O&M costs be recovered, and by whom?
- Should initial investment costs be recovered, and by whom?
- Should replacement and rehabilitation costs be recovered, and by whom?
- Will cross subsidies be used? Who will be targeted? How? Where will the money be coming from?

There is a need to define clearly the financial responsibilities of stakeholders, including the community, national government, local authorities, NGOs, donor supported projects, donor programmes, and possibly others such as churches, individuals or the private sector. Defining financial responsibilities includes determining who is financially responsible for which costs, and over what period of time. While "cost sharing" arrangements are now widely accepted, they will also require that all parties define precisely the boundaries of their responsibilities, and that these are sealed in an agreement or a contract.

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## 6. Recovering costs: tariffs, subsidies and financial support mechanisms

There are a number of ways in which costs can be recovered. Tariffs, subsidies, and financial support mechanisms can all contribute towards sustained service delivery while raising consumer awareness for the financial, economic and environmental aspects of providing such service. It is generally agreed and widely accepted that users should, in most cases, pay for recurring costs, while there are varying opinions about whether users should pay for capital costs, and if so, what percentage is reasonable, and how might it be paid (cash, sweat equity, smaller payments over time coinciding with crop or livestock market season, etc.).

### Tariffs

Tariffs determine the level of revenues that service providers receive from users. They are designed for different purposes, and often contain some elements to address poverty. They can be set either at the service provider level or by national (or local) government. More often than not, setting tariffs is a political process that is rife with controversy.

The goals of a tariff vary and may include:

- Raising enough revenues to cover specific costs. These can be operation and maintenance costs, financial costs or even reflecting the full marginal cost, i.e., the extra money required to provide an additional unit of water;
- Making access to drinking water affordable for different income groups, which should take into account the ability to pay for a service and the fact that there are major impacts for health, well-being and poverty alleviation targets. The tariff should not be too high to drive consumers to unsafe alternatives or to decrease daily use to dangerous levels (box 9);

**Box 9: Impact on quantity of water used as a result of changes in water prices**

“The empirical work is often lacking that would enable someone to know with reasonable confidence how changes in water prices would affect the quantity of water different customers would use and whether to connect (or stay connected) to the water distribution system.”

Source: *Whittington & Boland (2002)*

- Sending appropriate price signals to users about the relationship between water use and water scarcity;

- 
- Fairness as perceived by the consumers. Some of the many factors that affect willingness to pay for water services are described in the Annex and this WSP<sup>8</sup> document shows that it is not well correlated with levels of income - a common misapprehension in the water services sector.

Generally, tariffs in developing countries have at least one thing in common: they are set well below the level needed to cover even operation and maintenance costs. Research has shown that low tariffs are set largely for political, rather than practical, purposes. While low-income users have demonstrated a willingness to pay for water services, both through willingness-to-pay surveys, but also by proxy, in the amount spent on purchasing bottled water or from vendors, free water is consistently used as a campaign promise, for political gain. In fact, political interference has been found to be a significant barrier to effective cost recovery (see also Komives et al, 2000).

Tariffs are generally set through national or state policy although the public or private sector can also calculate them for an individual project, sometimes at the community level. Whether set by the public or private sector, tariffs can be designed within a policy framework that addresses the needs of the poorest. However, without better data and accounting systems and with no right tools to calculate costs that may have been originally set decades ago, it is difficult to make progress in tariff designs.

Here, we look at six different tariff systems:

- Fixed Charge Tariff (Single Tariff)
- Constant Volumetric Tariff
- Increasing Block Tariff (IBT) and Two Part Increasing Block Tariff
- Decreasing Block Tariffs
- Output-Based Tariff
- Seasonal and Zonal Tariffs

User fees are generally charged for the ongoing costs of supply, while connection fees to a network, or installation costs for pumps are charged separately.

#### *Fixed Charge Tariff (also known as a Single Tariff)*

Fixed charge tariffs are often used when there are no water meters to measure usage. Under a fixed charge tariff structure, consumers pay a certain amount independent of the volume used. Sometimes there are different tariffs based on different types of users (industry, agriculture, etc.), property values or pipes diameters (See box 10 Uganda example).

The benefits of the fixed charge tariff are in its simplicity; however, there are no incentives for water conservation and some of the water might be sold at high prices by street vendors to the households with no access to the taps or connections.

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<sup>8</sup> Garn, Harvey. 1997. "Lessons from Large-Scale Rural Water and Sanitation Projects: Transition and Innovation." WSP, Washington D.C. <http://www.wsp.org/pdf>

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**Box 10: Single-Tariff Pricing in Uganda**

In Uganda in 1995, tariffs were set by the National Water and Sewerage Corporation, which had a monopoly over service provision at that time. Water charges included all operations and maintenance costs, depreciation and capital costs and also social equity. As of April 1995, un-metered residential consumers paid flat rates that were based on the number of taps. The box below demonstrates the difference between metered and un-metered connections. (Conversion rate zeros missing)

<b>Uganda – Flat Tariffs for Un-Metered Use</b>	
In Ugandan Shillings: US\$1 = 1-5- shillings (1996)	
Number of Taps	Amount Shillings
1 Tap	3,696
2-4 Taps	11,088
5-8 Taps	18,480
Over 8 Taps	27,720
Metered (per m3)	616

Source: World Bank (1997)

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### *Constant Volumetric Tariff*

In a constant or uniform volumetric tariff all the users pay the same per unit of water used, independently of the use: industry, commerce or household (See box 11 Netherlands example).

#### **Box 11: Constant Volumetric Tariff**

In the province of Overijssel, in The Netherlands, the price per m<sup>3</sup> remains constant. All the costs of operating and managing the system and providing the service are recovered. Besides the charge for the water used, a tax is charged for using the water pipelines: € 0,141 per m<sup>3</sup> for the first 300 m<sup>3</sup>.

<b>Overijssel, The Netherlands – Constant Volumetric Tariff In Euros, 2003</b>		
Usage (m <sup>3</sup> / hour)	Fixed sum (€ / year)	Price per m <sup>3</sup>
< 2	16,52	1,175
≥ 2 < 6	130,00	1,175
≥ 6 < 10	481,00	1,175
≥ 10 < 15	3.020,00	1,175
≥ 15 < 20	4.440,00	1,175
≥ 20 < 25	5.860,00	1,175
≥ 25	On request	1,175

### *Increasing Block Tariff (IBT) and Two Part Increasing Block Tariff*

Block tariffs are by far the most common tariffs for water services. Under a block tariff scheme, users pay different amounts for different consumption levels. The rate per unit of water increases as the volume of consumption increases (See Botswana example box 12). Higher rates are set for higher levels of use with industrial and commercial users paying a higher rate. It has been used in countries such as Spain and Turkey where water is scarce.



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**Box 12: IBT Tariff in Botswana**

In Botswana, the Ministry of Mineral Resources and Water Affairs has been responsible for national water policy since 1993. A pricing system was implemented based on principles of equity, efficiency and cost recovery. Water from standpipes was supplied free, and households with private connections were provided with a lifeline-type tariff for the first 5 m<sup>3</sup> consumed. Ranges for consumption were grouped according to bands – the box below shows the ranges of consumption and tariffs charged.

<b>Botswana IBT Tariff</b>		
In Botswana Pulas: US\$1 = 2.82 P (1996)		
Band	Use per month, m <sup>3</sup>	Tariff P per m <sup>3</sup>
1	0-5	0.45
2	6-20	0.90
3	21-40	1.80
4	>40	3.50

Source: World Bank (1997)

A small variation of the IBT, the two-part tariff includes a fixed minimum monthly charge for all consumers, in addition to either a flat or variable tariff based on usage. This tariff combines a fixed service charge plus two or more blocks of prices that increase as consumption increases. Billing, for instance, which is independent of consumption can be covered by the fixed charge (See Malaysia example in box 13).

**Box 13: Two Part Tariff in Malaysia**

In Malaysia, Ranhill Utilities Berhad, a water supply group, received approval from the State Government of Johor in May 2003 to increase water tariffs for different users. Multiple tariff structures are being used, such as an increasing block tariff for domestic users and industry; a uniform tariff for shipping and plantations, and a two-part tariff for government institutions. Details for the two-part tariff are presented in the box below, with minimum charge, and a flat rate for additional consumption. The tariff took effect on 1 July 2003.

<b>Malaysia – Two-Part Tariff</b>	
In Malaysian Ringgets: US\$1 = 3.8 R (2003)	
Amount	Revised Rate (2003-2005)
Flat Rate	2.13/m <sup>3</sup>
Minimum Payment	9.24

Source: Kuala Lumpur Stock Exchange announcement

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Sometimes these tariffs are also called lifeline tariffs or social block tariffs because they aim to address the needs of the poor by providing a basic level of consumption (for example, using the WHO guidelines of 20 litres per day for basic needs) either for free or at very low cost, with a form of block tariff for consumption above the lifeline level (see Ghana example in box 14). The goal is to provide basic services for the poorest of the poor, while covering the marginal cost of providing the service, with users paying increasing amounts as level of consumption rises.

See illustration of calculations according to Colombian Public Services Law in example 2, in Annexes.

**Box 14: Lifeline Tariff in Ghana**

In Ghana, the Ghana Water Company Limited sets tariffs with the approval of the Public Utilities Regulatory Commission. As of the end of 2002, metered domestic customers who consume up to 10,000 litres per month pay a “lifeline” rate of 990 Cedis per 1,000 litres (US\$1 = 8,450 Cedis), an increase of 98%. Other domestic customers who consume more than 10,000 litres per month pay rate increases of 98% to 177%. Boreholes, wells and hand-pump users pay a flat rate of 3,000 Cedis per house per month. Consumers who obtain water from standpipes pay 1,000 Cedis per 1,000 litres, an increase of 150%.

Supporters claim that IBTs transfer income (see Cross Subsidies later) from the richer including the industrial sector to the poorest households. In theory, social block tariffs allow the poor to benefit from water services at low prices, although this is not necessarily so if many poor consumers share a single water connection (very common in India). That drives consumption – and prices – much higher than better-off users pay and more than if the poor had a private connection. Further, most block tariffs include such a large initial block that the poor and non-poor benefit, reducing potential payments (see Boland and Whittington. 2000).

The poor connected to the network are likely to have lower bills (with lower usage), while high-use consumers may be encouraged to conserve water, given the cost of the tariff for consumption. However, while this works for those poor who have network connections, the poorest of the poor are often not served by networked services and do not benefit from the lifeline tariff.

One alternative to correct some of the inefficiencies of IBTs<sup>9</sup> would be to charge the same price per unit for all income groups and add a fixed charge for different income groups. For the poorest this would mean a negative fixed charge to be deducted from the volumetric charge. Nevertheless, this proposal assumes that the poor can be easily identified and the whole process involves high administrative costs. Furthermore, for households with low consumption this would mean tariff values below the fixed charge and it does not solve the

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<sup>9</sup> “Twelfth Meeting of the Urban Think Tank – Tariffs and Subsidies” <http://www.wsp.org/pdfs>

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problem of those who are not connected. The pros and cons of such a system are described in a WSP publication on discussions of the Urban Think Tank.

#### *Decreasing Block Tariffs*

In Decreasing Block Tariffs, consumers are charged a higher cost per unit of water at lower consumption levels. As the consumption level increases, the price per unit decreases.

This type of tariff, used primarily in the United States, penalizes low levels of consumption and provides an economic incentive for water use and a disincentive for water conservation (See box 15 US example).

#### **Box 15: Decreasing Block Tariffs in the United States (Rhode Island)**

Newport and Pawtucket, Rhode Island, supported decreasing block tariffs until 2002, when they changed to a uniform tariff. In both communities, tariffs are set by the Newport Water Works and Pawtucket Water Supply Board, with the approval and regulation of the Public Utilities Commission. The box below demonstrates the declining tariff:

<b>United States – Declining Block Tariff</b>	
In US Dollars	
Usage (ft <sup>3</sup> )	Tariff (\$/100 ft <sup>3</sup> )
0-333,000	1.35
> 333,00	1.12

#### *Output-based Tariffs*

Output-based tariffs are an innovative approach to tariff design and they are not yet used. The way they are intended to work is that users pay in exchange for improved service and based on a schedule of improvements promised by the water supplier. This system is fairly simple to implement and readily understandable by consumers, who can literally see the results of their payments. With this tariff, it might be difficult to apply cross-subsidies and it assumes low mobility of the population concerned.

#### *Seasonal and Zonal Tariffs*

Very rarely used, these are tariffs which are dependent on seasons or areas where water availability varies. Chile uses seasonal tariffs in areas where rainfall patterns and water storage capacity mean that water supplies vary across seasons. Similarly, a zonal tariff can be higher in areas which are not easily reachable by the service provider. Zonal tariffs are not used formally; in reality remote communities end up paying more per unit of water because they are dependent on water resellers, rather than the utility.

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## Subsidies

Within a sustainable development framework, the need for subsidies to provide services to the poor is understood and widely accepted. It is generally agreed that in poor areas of middle and low income countries, subsidies are necessary to cover basic amounts of water usage by poor customers. However, in a networked system, the poorest are not a part of the network in the first place, and many benefits accrue also to wealthier consumers.

Thus, when considering cost-recovery strategies, subsidies need to be re-thought: how are specific subsidies structured, how are they used, how can they better meet and target the needs of the poor?

Different types of subsidies achieve different purposes. Some types of subsidies might be better than others, depending on the type of project and the level of data, capacities and resources needed to manage and administer subsidies. Subsidies and tariffs are clearly highly interrelated.

Significant research has been conducted over the last several years on subsidies and their effectiveness, with the conclusion that subsidies should be provided only as part of a poverty reduction framework, and should be used, generally, to promote access to basic water and sanitation services rather than providing ongoing support for consumption. Reasons cited include the high administrative costs of providing effective subsidies, and meeting the needs of the poor who are not connected to a network.

The initial upfront cost of new connections is one of the main barriers preventing poor households from being connected to the services. While many are unable to pay upfront for the amount of the connection, many are paying regularly to small water providers - more than double the price of those connected. Subsidies can help to reduce the initial costs of the connections, enlarging the client base and sometimes contributing to providing economies of scale to the water provider (see box 16 Cote d'Ivoire example).

### **Box 16: A combination of strategies in Cote d' Ivoire**

In The Ivory Coast, water services to all towns and cities is supplied and managed by a private company (SODECI) as of 2002. It applies three types of mechanisms to help the poor: subsidized household connections, with the subsidy coming from a surtax on water bills; a rising block tariff, another type of cross subsidy that increases finances and therefore services in smaller towns from the economic base of Abidjan with the tariff fixed across the country; and licensed water resellers in informal settlements.

*Source: Collingnon (2002)*

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### *Direct subsidies*

Direct subsidies aim to target the poor through government payment of a portion of poor consumers' water bills. Direct subsidies are used in Chile and Colombia (Foster et al. 2000), and have been effective to varying degrees. In Chile, the subsidy is provided to the poor directly through national and municipal budgets. In this case, the utility receives the same revenue independently of the economic situation of the consumer and therefore has the same incentive to serve the poorest as for the wealthier groups.

One drawback to direct subsidies is their high administrative cost, which may be prohibitive for governments experiencing budget constraints or lacking public administrative capacity. In Chile, subsidy recipients are determined through a national socio-economic survey that provides information on households to multiple government agencies offering subsidies for many different public services.

### *Cross subsidies*

Within a networked system, cross subsidies are used to assist lower-income consumers through surcharges either from wealthier consumers, or from commercial and industrial users. Here, the lower income consumers are effectively undercharged for water, while the higher-income consumers are overcharged. (see Yepes 1999)

Cross subsidies have also been structured in some West African countries to subsidize access to rural areas from urban centres, but still operating under the same principle. Cross subsidies can be used to expand access to water services, if the customer base is large enough to absorb the extra connection costs. Under this type of cross subsidy, a portion of existing customers' bills would go towards expansion costs for a utility. In this way, existing customers subsidize new customers. This use of cross-subsidization might be more sustainable, as the other tends to target the poor ineffectively, while providing incentives for the higher-paying users to seek other sources of supply, constraining the system (see Cote d'Ivoire example in box 16).

### *Output-based subsidies*

As with output-based tariff structures, under an output-based subsidy structure, operators are provided with subsidies from the government to address gaps in service delivery levels and other factors that are specified as benchmarks to development.

Some applications of output-based subsidies include:

- Subsidies for expanding coverage (where increasing connections in poor areas are emphasized);
- To support a transition from an existing tariff structure to a more up to date tariff level (Brooke 2002) (with benchmarks including increased collection rate); and
- Subsidising wastewater treatment by rewarding a company for the level of pollution removed (or prevented).

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In countries or regions where connection is not an issue, output-based subsidies may be used for consumption (Gomez-Lobo 2002).

### Other financial support mechanisms

The financial challenge to increase sustainable access to water and sanitation services is substantial. Given the large increases in service provision that are required, tariffs, subsidies and taxes will be insufficient to increase coverage and provide system upgrades. In developing countries, most of the financing for the water supply and sanitation sector comes from the domestic public sector, followed by external aid. Other sources include small-scale domestic private providers, international private sector, international and local non-governmental organizations and neighbourhoods, communities and households.

Although much has been said and written in support of increased private sector investment, it will require the coordinated efforts of public, private, civil society, and users to maximize their comparative advantage, to provide the additional financial support mechanisms to meet the MDGs. The international private sector per se will not be able to fill the financing gap. Presently, about 5% of the world's population receive water from international private companies and these are located in highly urbanized areas such as those in Argentina, Philippines and Chile (UNDP, 2003). Where the poor have benefited from privatized water services it has been due to political will such as with the obligation for connecting a certain percentage of the population to piped water (e.g. Bolivia) or setting a ceiling for the percentage that tariffs can take of household income and complementing them with subsidies (e.g., Chile).

It is important to remember that in Canada, Western Europe and the United States, basic social services including drinking water and sanitation became universal only when governments intervened in between 1875 and 1950 with massive injections of funds. (UNDP 2003)

This section provides an overview of some relevant financial support mechanisms. For an in depth analysis we recommend the World Bank publication "Meeting the Financing Challenge for Water Supply and Sanitation"<sup>10</sup>.

### *Overseas Development Assistance*

At the Monterrey Conference on International Development Finance in 2002, donors agreed to increase their ODA contributions to 0.7% of GNP, although the timeframe for implementing that goal remain undefined. At present, most countries contribute less than 0.5%, some considerably less. While the commitments at Monterrey did not include any specific attention to water, the attention of world leaders at recent conferences – and the

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<sup>10</sup> Mehta, Meera. 2003. "Meeting the financing challenge for water supply and sanitation: Incentives to promote reforms, leverage resources and improve targeting". World Bank – Water and Sanitation Program, Washington DC

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attention paid to financing the water sector, from the Camdessus Panel<sup>11</sup> at the Third World Water Forum in March 2003 to the Statement on Water at the G8 Summit<sup>12</sup>, in June 2003 implies a commitment amongst donors to increase aid to the water sector. Donors should be held accountable for their commitment to increase aid to the water and sanitation services sector. However, to bridge the finance gap to reach the Millennium Development Goals, a more effective prioritization of aid flows is also needed to ensure that aid is effectively addressing people affected by poverty (See box 17 “ODA: A question of priorities”.)

**Box 17: ODA: A question of priorities**

Throughout the 1990s Overseas Development Assistance (ODA) has not been channelled to the countries that needed it the most:

- Low-middle income countries received more aid for WSS than least developed countries;
- Contrary to the decade trend, aid to least developed countries decreased as a percentage of total aid;
- Asia and Africa, which have the majority of the unserved populations, receive less WSS aid per capita than Oceania or Europe.

*Source: Terry C. and B. Calaguas (2003)*

WaterAid Nepal has developed a tool for calculating the resources gap (Terry C. and B. Calaguas. 2003) to estimate the WSS targets in Nepal. This tool can be used as a framework to help donors and policy makers to better target resources by identifying the major resource gaps by areas or income groups. Providing financial assistance, whether for rehabilitation or a new project, can have lasting impacts, but there is the need to raise awareness of the support costs that will guarantee a sustainable service provision.

Small loans or grants can also make a strong difference in covering some of the costs of serving the poor. Financial assistance is often required to jump-start a programme and provide initial capital costs, or the costs of establishing a savings account or other financial means to promote savings for future investment.

These mechanisms can be provided on an output-based basis. For example, seed funding for capital costs that is repaid as part of the project’s financing can be recycled to other projects over time. This helps the recipient to develop financial management and responsibility, while the donor is provided with funds to help additional projects.

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<sup>11</sup> <http://www.worldwatercouncil.org/download/CamdessusReport.pdf>

<sup>12</sup> [http://www.g8.fr/evian/English/navigation/news/news\\_update/water\\_-\\_a\\_g8\\_action\\_plan.html](http://www.g8.fr/evian/English/navigation/news/news_update/water_-_a_g8_action_plan.html)

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### *Micro-credit schemes*

“There is enough evidence on the ground about the enormous potential of micro credit in improving service delivery at the lowest income levels.” (WSP-South Asia, 2000b)  
However, if these have been successful at the individual settlement level, it has been more difficult to use them at city level.

Micro-credit involves lending mechanisms that are similar to credits given by banks, except that they differ in their scope. Micro-credits are generally small in volume and respond directly to the specific needs of rural or low-income urban individuals. It is possible to distinguish three types of micro-credit:

- Micro-credit through a bank;
- Micro-credit through an association;
- Micro-credit through individuals.

A micro-credit system can be used to:

- Contribute to investments;
- Purchase material and equipment for replacement, extension and rehabilitation;
- Finance major unforeseen repairs;
- Cover short-term cash-flow problems;
- Develop a stock of spares, parts and tools.

The development of a micro-credit system through an association or individuals to finance important capital investments is difficult due to the small amount of money and the short-term nature of the credit provided. These systems have, however, been instrumental in financing small individual activities, such as rainwater harvesting or a hammer and pulley system for wells. Where a water supply system already exists, micro-credit can be used to help the poor to afford a connection.

In general, micro-credit systems can overcome financial obstacles and promote development in areas that are beyond the reach of the conventional banking system. They provide a strong tool to alleviate poverty, and to offer marginal groups within a community a possible access to finance for small, income-generating activities.

For major investments, communities still need to secure finance from banks or rural development funds. The challenges and constraints faced by the poor in lending can be overcome through strategic partnerships with local non- governmental organizations and the private sector (See box 18 for India example).



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**Box 18: Self Help Micro Credit Scheme for Rural Sanitation in India**

As part of the Indian government's Total Sanitation Campaign, The Soozhal women's micro-finance scheme raised nearly \$23000 for revolving loan funds, and together with seed money from a Dutch NGO complemented government subsidies to build latrines. The self-help group members trained as hygiene communicators, ran the micro-credit schemes and oversaw latrine building projects in schools in the Cuddalore District of Tamil Nadu.

The programme showed how to make use of limited resources from domestic and external sources to benefit large numbers of low income households

*Source: Terry C. and B. Calaguas (2003)*

Funds to purchase materials and equipment for replacement, extension and rehabilitation differ from initial capital investment in that the need for these can be projected in advance. Some projects cover future replacement costs in their tariffs. In these cases, this part of the payments can be used as savings or as guarantees for possible credit.

Inadequate tariffs and fluctuations in the incomes of consumers create cash flow problems and make it difficult to finance unforeseen repairs. It is of utmost importance to ensure financial support mechanisms to meet these contingencies. Micro-credit systems through associations are particularly appropriate where the amounts needed are not excessively large.

The development of a stock of spare parts and tools can also be critical to sustain a rural water supply, especially when communities are isolated and geographically remote from major trading centres. Developing a micro-credit system can also be beneficial for this type of expenditure, even preferably for a supply chain for parts and tools,

#### *Social and development funds*

Social and development funds are increasing in importance both as part of a community development strategy accompanying private sector development in extractive and other industries, and as a means for donors to channel funding to governments for programmes, rather than specific projects.

Different types of funds have been established which have a social and development aim, including the water and sanitation services sector. The principal attractions of social and development funds are low interest rates and long repayment periods. Governments can generally provide credits at lower interest rates than the commercial financial markets.

Through a fund, credit is extended to institutions or local governments for general development use at the local government level. Unfortunately, it is not easy for users or

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community groups to access these funds directly. There is, however, a trend at present to establish funds that respond better to the needs of rural populations.

A good example can be found in the Social Investment Funds promoted by the Inter-American Development Bank. A strong feature of the funds is their ability to tailor themselves to changing circumstances without sacrificing their efficiency and effectiveness. Through their closer contact with communities, the funds have opened new avenues for social action and have increased public awareness of poverty issues (read more<sup>13</sup>). However, the funds respond mainly to investment needs for new construction or for major overhauls, and are not necessarily available to finance short-term needs and unforeseen breakdowns.

Moreover, past experience has shown that communities still have great difficulty in accessing resources from these funds, while project reports often mention mismanagement as a major obstacle to efficiency. Since access is easier for local authorities and municipalities than for communities, it is important that communities and municipalities work in partnership.

#### *Community/local level funds*

In communities with significant seasonal variations in income, such as agricultural workers in rural areas, service providers often find it difficult to recover costs through regularly charging the users. Hence there is a potential mis-match between the costs that need to be paid by the provider, for example expensive capital costs for refurbishment, and users' ability to pay. An alternative is to cover the costs through community fund-raising where "families do not pay regular contributions towards the cost of the community water system. Instead, money is periodically accumulated in other ways" (Van Wijk-Sijbesma 1989). Community fund-raising options include voluntary funds, general community revenue and payment in kind.

#### **Voluntary funds**

Voluntary funds are built up by voluntary contributions from local leaders or community groups through public meetings, bazaars, lotteries, festivals and similar social activities. These are common to finance construction and major repairs in communities that have a tradition of fund-raising and seasonal income. People contribute to finance a particular project or activity. The success of this option depends on a certain social cohesion that ensures that users contribute according to their use of water and ability to pay.

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<sup>13</sup> <http://www.iadb.org/sds/doc/957eng.pdf>

"The Use of social Investment Funds as an Instrument for Combating Poverty", 1998. IABD Strategy Paper.

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**General community revenue**

Communities can develop communal productive activities, such as cash crops or a village shop, and pay water bills with their profits. Disputes may arise over the priorities for use of these resources, especially when users do not have equal access to water supply.

**Payment in kind**

Households are sometimes given the opportunity to pay part of their contribution to the construction of their water supply in kind, by providing voluntary labour for trench digging, transport, sand pipe laying, or by providing local materials, such as gravel and sand.

Payment of part of the construction costs in labour instead of money makes the system more affordable to a larger number of households than when all the payments have to be made in cash.

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## Annexes

### Example 1 – Cost and local tariff calculations for a handpump installation

#### *Brief description<sup>14</sup>*

In this example, the handpump can reach a depth of 15-45 m. Water delivery yield is 0.30 l/s and the handpump is used by a rural community of 250 inhabitants. The majority of beneficiaries are poor and they have a water committee to manage the service. The handpump is operated by users and maintained by a caretaker. When necessary, the water committee hires a mechanic to perform major repairs.

#### *The costs are the following:*

Investment costs include construction costs, equipment, tools, spare parts and the drilling of the well. The main parts of the handpump are the cylinder, plunger, footvalve and pumping head (construction costs). All of these parts have a life cycle of about 10 years with proper maintenance. The equipment, tools and spare parts include: buckets, broom, brush, lubricator, spanner, screwdriver, wrench, knife, pipe threader, tackle, trowel. These tools have to be replaced every year. A private contractor does the drilling of the well.

#### Investment cost for a deep well handpump

Type of cost	Value in US\$
Construction costs	2000
Equipment, tools and spare parts	500
Drilling	1000
<b>Total investment costs cost</b>	<b>3500</b>

Recurrent costs include the maintenance of the handpump and the administrative tasks for the management of the system. The former include payment of caretaker wages, purchase of tools (bucket, spanners, wrench, trowel, screwdriver, etc), materials (grease, paint, uniform, gravel sand, cement) and spare parts (nuts, bolts, cupseals, bearings, main tubing, threads, pipe threads), and payments for a mechanic to perform major repairs.

Once a year a private contractor carries out a maintenance service on the well to keep it functioning in a proper manner. The treasurer of the water committee manages the system. He does not receive a salary, but gets a commission. Expenditure on administrative tasks is low because the treasurer writes bills on a simple sheet and he collects the money at his home. The treasurer delivers bills at the handpump site and does the bookkeeping every week. The total time the treasurer allocates to the system is four hours every day.

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14 Adapted from Brikke and Rojas (2002)

Recurrent cost for one year

Type of cost	Value in US\$
Maintenance	
Wage (caretaker)	150
Tools	10
Materials	40
Spare parts	100
Mechanic (big repairs)	150
Private contractors (maintenance of the well)	50
<b>Total Maintenance</b>	<b>500</b>
Management	
Commission (treasurer)	100
Paper	50
Unforeseen expenses	50
<b>Total Management</b>	<b>200</b>
<b>Total recurrent cost</b>	<b>700</b>

*Future investment costs.* In order to increase the capacity of the system for the growing number of users, an additional well will need to be drilled in ten years time. The main parts of the well will require replacement, also in ten years.

*Tariff calculation*

Basic information on yearly costs	
Investment cost	US \$3500
Functioning cost per year	US \$700
Approximation of replacement-extension costs = 25% of functioning costs	$25\% \times 700 = \text{US } \$175$
Funds for the recovery of investment costs (RIC) = estimated 10% investment cost	$10\% \times 3500 = \text{US } \$350$
Depreciation* = Cost (equipment, facilities, construction, buildings)/life cycle	$2000/10 = \text{US } \$200$
Provision for risk and inflation = 15% of depreciation costs	$15\% \times 200 = \text{US } \$30$

\* In this case, the depreciation affects only the main parts of the handpump (construction cost), because the equipment (tools etc.) is replaced every year. The formula for calculating depreciation is therefore simple.

\*\* Provisions for risk and inflation include an annual rate of 5% for risk and 10% for inflation.

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*Minimum tariff (covering O&M and basic management costs)*

Functioning costs per month/Number of users =  $(700/12)/250=0.23$  US\$ per user per month

*Tariff taking into account other financial costs*

The investment costs have been paid by an international NGO  
(Functioning costs + replacement & extension costs + RIC + Depreciation + provision for risk and inflation)/Number of users =  $(700+200+350+200+35)/250 = 5.94/12 = 0.49$  US\$ per user per month

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## Example 2 – Costs and tariff setting for a piped system

### *Description*<sup>15</sup>

A rural community in Colombia, is supplied with a Multi-Stage Filtration System for the treatment of water, which produces drinking water for 500 users, all of them with private taps. The water service is continuous and drinking water reaches the parameters required by the Colombian law.

The community manages the system through a water committee, which hires one person from the community with moderate educational level to manage the service. An operator and caretaker operate and maintain the system. The community, which is responsible for the most important decisions, elects the water committee. The costs of the water supply system are assessed for 30 years, using a discount rate of 12%. The costs are as follows (in Colombian currency of 1996):

**Investment costs** are the initial costs and include construction of infrastructure, land, equipment, pre-feasibility studies and so on.

<b>Initial Investment Costs (IIC)</b>	<b>Value in pesos 1996</b>
Intake	170,905
Sand Trap	4,533,619
Raw Water Main	7,363,188
River Crossings	6,414
Sedimentation	16,435,600
Upflow Roughing Filter	19,514,075
Dynamic Roughing Filter	7,595,377
Slow Sand Filter	59,071,822
Drainage	893,653
Water Storage Tank	26,766,841
Distribution Network	37,748,853
Water Storage Tank 2-3	7,500,000
Sand Storage	7,000,000
Design	7,000,000
Metering	91,000,000
<b>Total</b>	<b>292,600,347</b>

**Recurrent costs** include operation, maintenance and management costs.

Operation and maintenance costs are related to the functioning of the technical components of the system, and include wages for the operator and caretaker, salaries for outside experts (for example to re-sand filters), payments for water quality analysis, materials for minor repairs, expenditure on inputs, etc.

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15 Adapted from Brikke and Rojas (2002)

<b>Operation and Maintenance Costs</b>	<b>Value in pesos 1996</b>
1. Total expenditures in wages and salaries	6,076,860
1.1 Operator (1)	2,160,000
1.2 Social security (2)	471,312
1.3 Tax (3)	585,900
1.4 Caretaker (4)	1,920,000
1.5 Social security (5)	418,944
1.6 Tax	520,704
2. Outside experts (6)	180,000
3. Chemicals (7)	960,000
4. Minor repairs and maintenance (8)	240,000
5. Equipment and spare parts (9)	120,000
6. Clothing (10)	120,000
7. Water quality analysis	500,000
<b>Total</b>	<b>8,196,860</b>

(1) Monthly salary \$180.00

(2) It is 21.82% of monthly salary

(3) 27% of monthly salary

(4) Monthly salary \$160.00

(5) 21.82% of monthly salary

(6) Hired for special tasks, for example re-sanding filters

(7) Chlorine \$ 80.00/month

(8) \$20.00/month

(9) \$50.00/month

(10) \$20.00/month in uniforms for operator and caretaker

*Management costs.* They include the salary of the manager, the maintenance of the computer (which is used to produce water bills and to keep invoices, registration forms and books), stationery, public services (in the office of the water committee), etc.

<b>Management Costs</b>	<b>Pesos 1996</b>
1. Total expenditure in wages and salaries	2,923,680
1.1 Manager (1)	2,400,000
1.2 Social security (2)	471,312
1.3 Tax (3)	585,792
2. Billing and Collection cost(4)	780,000
3. Public services(5)	120,000
4. Stationery (6)	180,000
5. Computer maintenance (7)	120,000
<b>Total</b>	<b>4,123,1680</b>



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- (1) Monthly salary \$ 200.00
  - (2) 21.82% of monthly
  - (3) 27.12% of monthly salary
  - (4) Billing and collection cost \$65.00/ month
  - (5) Public services \$20.00/ month
  - (6) Monthly expenditure in stationery \$20.00
  - (7) Yearly maintenance contract \$120.00

*Future investment costs (FIN)* reflect the amount of money required to replace and to extend the main components of the system. In this case, it will not be necessary to extend the system because the capacity is twice the required capacity to supply the locality. All that will be necessary is the replacement of some components.

<b>Future Investment costs</b>		
Component	Period	Investment value
Treatment plant	Every 15 years	147,210,173
Distribution Network	Every 10 years	28,482,984
<b>Net Present Value of Future Investment (FIN)</b>		<b>142,786,285</b>
<b>Future Investment costs</b>		
Component	Period	Investment value
Treatment plant	Every 15 years	147,210,173
Distribution Network	Every 10 years	28,482,984
<b>Net Present Value of Future Investment (FIN)</b>		<b>142,786,285</b>

*Cost calculation according to Colombian public services law*

*Average investment cost (AIC)* is the cost of investing now and in the future in order to produce and distribute one cubic metre of water. It includes the initial and future investment (INI and FIN), the total water produced during 30 years (TWP = 2,566,053 m<sup>3</sup>) and the share of investment recovered through connection cost that users should pay (variable C, which is 0 in this case):

$$AIC = [INI + FIN * (1 - C)]/TWP$$

$$AIC = [(294,420,347 + 142,786,285) * (1-0)]/2,566,054 = 170/m^3$$

*Average operation and maintenance cost (AOMC)* is the cost of operating and maintaining one cubic metre of water during the year in which the cost analysis has been done. It includes the water production (284,824 m<sup>3</sup>) and the leakage index (P=30%) for the same year.

$$AOMC = \text{Total operation and maintenance cost} / [M^3 \text{ produced} * (1 - P)]$$

$$AOMC = 8,196,860 / [284,824 * (1-0.30)] = 41/m^3$$

*Long term average cost (LTAC)* is the cost of operating, maintaining and producing one cubic metre of water, taking into account the actual and future treatment capacity of the water supply system

$$\text{LTAC} = \text{AIC} + \text{AOM}$$

$$\text{LTAC} = 170 + 41 = 211/\text{m}^3$$

*Average management cost (AMC)* is the cost of guaranteeing the availability of the service to users. It includes the total management cost and the total number of users during the year in which the analysis is done.

$$\text{AMC} = \text{Total management cost}/\text{Number of users}$$

$$\text{AMC} = 4,297,104/499 = 8,611 \text{ user-year}$$

$$8,611/12 = 718/\text{user-month}$$

#### *Tariffs according to Colombian Public Services Law*

Tariffs and cost have been calculated according to the legal framework of the water supply service.

#### Classification of users by strata<sup>16</sup>

Strata 1	169 users
Strata 2	297 users
Strata 3	163 users
Commercial and Industrial	24 users
Official	10 users

#### Consumption ranks

Basic consumption to satisfy the basic needs of a family	fixed at 20 m <sup>3</sup> /user a month
Complementary consumption is the consumption	between 20 m <sup>3</sup> to 40 m <sup>3</sup> /user a month
Luxury consumption	consumption above 40 m <sup>3</sup>

#### Subsidies and extra-charges according to consumption ranks and strata

Strata 1	50% subsidy for fixed charges and basic consumption
Strata 2	40% subsidy for fixed charges and basic consumption
Strata 3	15% subsidy for fixed charges and basic consumption
Industrial & Commercial	Surcharge of 20% over all consumption ranks
Official	Does not receive any subsidy and does not pay any surcharge

<sup>16</sup> In Colombia, the Public Services Law (142/1994) established the classification of residential users into 6 strata according to socioeconomic conditions. The poorest are classified as strata 1 and richest as strata 6. Industries and institutions are classified as industrial and official users, respectively.

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Charges:

Fixed charge (FC)

This is the amount of money that users have to pay without considering their water consumption. It is to guarantee the current availability of service.

$$\mathbf{FC = AMC * SUB, \text{ where } SUB \text{ is the factor of subsidy or extra-charge per strata}}$$

For our case the fixed charges are:

FC 1	718 * 0.5	359
FC 2	718 * 0.6	431
FC 3	718 * 0.85	610
FC ind-com	718 * 1.20	862
FC official		718

Basic charge (BC)

Is the price for consumption of 0-20 m<sup>3</sup> and its calculation is:

$$\mathbf{BC = LTAC * SUB, \text{ where } SUB \text{ is the factor of subsidy or extra-charge per strata}}$$

In this case basic charges are:

BC1	211 * 0.5	105
BC2	211 * 0.6	127
BC3	211 * 0.85	179
BC ind-com	211 * 1.20	253
BC official		211

Complementary charge (CC) and luxury charge (LC)

The CC is the price charged for consumption between 20 and 40 m<sup>3</sup> and the LC is the price for consumption over 40 m<sup>3</sup>.

CC1,2,3 and official	LTAC	211
CC ind-com	LTAC * 1.20	253
LC1,2,3 and official	LTAC	211
LC ind-com	LTAC * 1.20	253

### Monthly tariff

The calculation of tariffs should be done using the formula:

$$\mathbf{T = [FC + BC * \text{consumption (m}^3\text{/month)} + CC * \text{consumption (m}^3\text{/month)} + LC * \text{consumption}] / (\text{m}^3\text{/month)}}$$

For a consumer in strata 1 which uses the maximum 20 m<sup>3</sup>/ month, the total tariff (in Colombian pesos) would be:

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$$TS1 = 359 + (105 * 20) + (211 * 0) + (211 * 0) = 2,459 \text{ pesos}$$

For a consumer in industry which uses the 45 m<sup>3</sup>/ month, the total tariff (in Colombian pesos) would be:

$$TS \text{ ind-com} = 862 + (253 * 20) + (253 * 20) + (253 * 5) = 12,247 \text{ pesos}$$

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## Examples 3 to 6: Trade-offs when assessing economic costs

### *Example 3: Costs of water pollution in China*

Water pollution from industrial, mining, and livestock discharges often increases public health problems and affects downstream uses of the resource. For example, with accelerating economic growth, urban growth rates in China jumped to nearly six percent in the early nineties. Wastewater from Chinese cities is mostly received by streams, rivers, and lakes, which lack the powerful natural treatment capabilities of big rivers like the Yangtze, leading to very low water quality. Heavy pollution in these rivers carries high economic costs. Those costs include: the need to replace or provide additional treatment for degraded potable water supplies; loss of agricultural and fisheries production; and loss of recreational and amenity value.

The loss of raw water sources for municipal supply appears to be particularly severe and the main cause of the rapid increase in water supply costs. In Liaoning Province, the Hun River supplies water to an underground aquifer that is used as a water source by the provincial capital Shenyang. The river passes through the industrial city of Fushun 20 km above the aquifer, where it picks up the city's industrial and domestic discharges, resulting in heavy pollution of both the river and aquifer. As a result of industry's lack of consideration for other users of the water, Shenyang was forced to construct a 51 km long, Y 564 million (then \$108 million) conveyor to the Dahuofang Reservoir on the Hun upstream of Fushun. Here, too little attention to the environmental costs of development in one city led to high financial costs incurred by another city. (Read more<sup>17</sup>)

*Source: World Bank (1994)*

### *Example 4: Land subsidence in Mexico*

Over-extraction of an aquifer occurs when water is removed at a higher rate than its natural recharge. For example, a percentage of the groundwater extracted for irrigation schemes may return and recharge the groundwater. However, the return flow will depend on many other factors such as evaporation, precipitation, and the rate of recharge. In many areas the groundwater is extracted at unsustainable rates, straining the long-term viability of the aquifer and even causing subsidence, or the sinking of land into the gap left by the empty aquifer.

For example, in Mexico, groundwater extraction has been an issue since the early 20<sup>th</sup> Century. Currently, subsidence has been stabilized at about 6 cm per year. However, some areas sank up to nine metres, the effects of which can be seen in infrastructure with cracking walls and foundations, and the need for additional supports – and stairs – to keep up with lowering street levels. The major challenge is to prevent flooding during rainstorms, as the natural course of drainage has been damaged by the subsidence. The combination of a sinking ground level with rising floodwaters and no natural drainage system poses a

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<sup>17</sup> [http://www-wds.worldbank.org/servlet/WDS\\_IBank\\_Servlet?pcont=details&eid=000009265\\_3961006134640](http://www-wds.worldbank.org/servlet/WDS_IBank_Servlet?pcont=details&eid=000009265_3961006134640)

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big challenge to Mexico City's peri-urban barrios, in terms of financing and developing infrastructure, as well as addressing the social dimension. (Read more<sup>18</sup>)

*Source: Morgan (n.d.)*

*Example 5: Valuing time saved in water collection*

It is difficult to compare the value time in different regions and even within countries in monetary terms, and different agencies use different approaches. For example, the Inter-American Development Bank measures time savings as equivalent to 50% of the market wage rate for unskilled labour. Others suggest using the local minimum wage rate as a basis for casual unskilled labour (ADB, 1999).

Using wage rates as a point of comparison is instructive; however there may be other tradeoffs that are not directly income generating, such as providing opportunities for education, especially for women.

*Example 6: Productive uses of water*

"More water, of better quality and provided more reliably, can provide the water needed for productive activities such as irrigation of a backyard or community vegetable garden, or for micro-enterprises like hair salons or tea shops. [...]"

A study<sup>19</sup> in Gujarat, India, showed how significant improvements in incomes were achieved when an improved water supply that saved women's time was combined with promotion of handicraft-based rural enterprises. These enterprises did not significantly depend upon making productive use of domestic water but the better supply enhanced productivity through time savings.

This project illustrates the utility benefit of water but the important message is that just providing the utility on its own was less effective than doing so in conjunction with a programme that supported the women in making use of the time saved. It demonstrates a livelihoods-based approach, which realized that time – and timely access to other key assets – is a prerequisite to making money. In order to maximize the benefits of the improved water supply it was necessary to address constraints associated with these other assets."<sup>20</sup>

*Source: Moriarty & Butterworth (2003)*

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<sup>18</sup> <http://www.science.uwaterloo.ca/earth/waton/mexico.html>

<sup>19</sup> James *et al.* 1992.

<sup>20</sup> For more on livelihoods approaches to drinking water supply see TOP on livelihoods <http://www.irc.nl/page.php/256>

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## About willingness to pay

Willingness to pay (WTP)<sup>21</sup> is an expression of the demand for a service, and it is a strong prerequisite for sustainable cost recovery because it is the materialization of users' satisfaction and of their desire to contribute to its functioning. This desire is normally associated with the users' willingness to contribute in monetary terms, in cash, but it can also be in kind. In some cases, users can hardly contribute in cash towards investment costs, but they can do it in kind, for example by providing voluntary labour for trench digging, transport, and pipe laying, and providing local materials, such as gravel and sand. Field experience shows that there is not a systematic correlation between willingness and ability to pay.

It is necessary to find out the conditions that affect demand and the desire of people to contribute to the service economically. Direct techniques for the estimation of WTP are based on the observation of what people actually do in order to ensure water provision (including how much money they have to pay for it). The indirect ways draw conclusions from users' responses to hypothetical questions about their willingness to pay for WSS services.

WTP studies are carried out to understand what level of services people want, why, and how much they are willing to pay for it. A useful way to improve willingness to pay is to improve relationships between consumers and the organization managing the water supply service (Figure 8). An increased trust and confidence, through better information and communication, can have a positive influence on user's satisfaction and willingness to pay.

<b>A. Community factors</b>	<b>B. Service factors</b>
<ul style="list-style-type: none"><li>• Demand and participation of communities</li><li>• Prevailing local customs and beliefs</li><li>• Income level</li><li>• Benefits derived from improved service (reduced distance travelled for fetching water; time gains, improved income generation, improved quality of service, improved social status, improved health, etc..)</li></ul>	<ul style="list-style-type: none"><li>• Presence of alternative sources of water supply</li><li>• Cost of improved water supply systems</li><li>• Management efficiency</li><li>• Reliability of service delivery (frequency of breakdowns, and delays for repairs)</li></ul>

*Figure 8: Major factors influencing willingness to pay*

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21 Adapted from Brikke and Rojas (2002)

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## Demand responsive approaches

### *Findings of a study involving 88 services in 15 countries*

Research<sup>22</sup> was conducted in 15 countries by several institutions<sup>23</sup>. It had the following two main objectives:

- to investigate possible linkages between sustained, well used, community-managed rural water services and participatory approaches which respond to demand and encourage equity with regard to gender and the poor;
- to develop and test a participatory methodology, now called Methodology for Participatory Assessment (MPA), which allows women and men in the community to take part in assessing their service and quantifies the outcomes of participatory tools for statistical analysis. Participatory tools are tools used by development workers for the empowerment of communities. Possible outcomes include improvements in community management, willingness to pay and financial management, as well as better service.

The study covered 88 community-managed water services in 18 projects in 15 countries. Services were selected at random but the projects volunteered. This affected the distribution of the services, which was skewed towards services with relatively better results. Nevertheless, there was enough variation to find significant differences. The study found significant linkages between gender, poverty and demand responsiveness. The most important findings on cost recovery were as follows:

- The more demand responsive the projects (with both women and men have a say in decisions about service planning, including arrangements for local financing), the better the services were sustained.
- The more communities were empowered (i.e., they had authority and local control during construction and management and they had been trained), and the better they accounted for the use of this power to the users, who were also the tariff payers, the better the services were sustained.
- Well-sustained services were also better used, with higher percentages of people having access to the water and a greater shift towards using only improved services, at least for drinking water.
- Users contributed to investment costs, through cash in 62% of the cases, and with their labour in 90% of the services.
- In half of the services, user payments covered operation and maintenance (O&M) costs; one quarter also paid for repairs and one quarter made some profit.

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<sup>22</sup> Gross, B., van Wijk, C. and Mukherjee, N. "Linking Sustainability with Demand, Gender and Poverty: A study in community managed water supply projects in 15 countries" December 2000. Water and Sanitation Program, Washington D.C.

<sup>23</sup> Organisations involved: IRC International Water and Sanitation Centre and World Bank Water and Sanitation Program with partners or consultants CINARA, Latin America; PAID, West Africa; ITN Philippines, The Philippines; Socio-Economic Unit Foundation, India; ICON, Nepal; Marga Institute, Sri Lanka; University of Indonesia, Indonesia; Institute of Water Development, Zimbabwe; Ministry of Water Resources and CMTS-East Africa, Kenya; Department of Water Affairs and Forestry, South Africa; Dept. of Water Cabinet's Office, Zambia.



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- The study found significant associations between more effective cost recovery and democratic decision-making on technology choice and maintenance arrangements, the involvement of women, better accounting and budgeting, and more timely payments.
  - All the communities included better-off, intermediate and poor households, yet only 9 of the 88 services had differential tariffs.
  - Within households, it was common for drinking water to be used for productive purposes, and this was seldom reflected in tariffs. Poor and better-off households both used water productively, when they could, but the better-off households had more opportunity to benefit from such uses. Though involving small amounts, they were one of the reasons for water shortages. On 88 water services, 28% had seasonal shortages and 10% never supplied enough water to meet primary household needs. In some services, productive uses were banned. In many cases it would have been better to design for these uses and their payment in participatory planning, as they could have generated income to sustain the service.
  - Agency policies and approaches have significant influence on effective and sustainable service delivery.

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## PART III – Resources



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## Case studies

The following case studies represent diversity not only of place but also of scope, politics, economics, and social considerations. They highlight themes such as the role of politics within the water sector, the viability of self-financed projects, and the role of decentralization and demand-responsive approaches contributing to sustainable service provision. They also represent a gamut of management approaches, such as public-public partnerships, private sector participation, and community owned and managed systems.

The objective of presenting these cases in an overview on cost recovery is to demonstrate the contextual importance of institutional constraints. Hence, these brief cases provide a glimpse into different systems under a variety of different settings, linked by their goals to increase and improve cost recovery.

Cases:

- Rural Wells in Zimbabwe (seed financing);
- Kerala Project in India (community self-financing);
- Slum upgrading in Tamil Nadu India (pay and use latrines);
- Marinilla, Colombia (community management with private sector operator);
- Small scale providers in Mauritania (small scale private sector);
- Rand water for ODI, South Africa (public-public partnership);
- Prepaid Meters in Lusaka, Zambia (peri-urban).

Case study: Rural wells in Zimbabwe (seed financing)

*This case study looks at rural water and sanitation supplies in Zimbabwe, and how cost recovery has aided households to obtain safe and sustainable water supplies.*

Zimbabwe initiated decentralized water supply and sanitation systems in the 1980s, at the time of independence. At the outset, the country adopted a supply-side approach, initiating a programme to provide 100% coverage of water supply and sanitation throughout the country by 2005. The programme achieved some success, installing 5,000 wells in the first two years in communities around the country. Since the mid 1990s, however, the national government (through the Ministry of Health) has taken a back seat role in rural water supply and sanitation, leaving control with external support agencies (ESAs) and the users themselves.

This shift in policy thinking was largely influenced by the economic decline that the country (and the people) faced throughout the 1980s. It resulted in the government being unable to pay for the rural water and sanitation programme, even with substantial support from international support agencies and aid, such as WaterAid, SIDA, DFID, and UNICEF. With the economic decline, the government adopted a strategy of decentralized government services – although it was unable to provide capacity building and funding to help the newly responsible community-level organizations to adapt.

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Implementing targets and designs for cost recovery was discussed throughout the 1990s in Zimbabwe to address the obstacles to achieving more sustainable results in the water and sanitation sector. The principle of community-based management was agreed by all, but use of cost-recovery principles had no political backing at the national level.

Consequently, rural people were left to gain access to water and sanitation themselves, and they worked with local non-government agencies to finance low-cost solutions. Generally, the rural areas adopted programmes that provided water at the household level, as this strategy had already been adopted with success for sanitation. By 1998, the strategy for using the household as the lowest organizational level for rural water supply was adopted by the country at large.

WaterAid initiated a substantial programme in Zimbabwe in 1993, which developed into the Mvuramanzi Trust. With strong support from the international development community, the Trust has helped over half a million people either improve their wells or gain access to water and sanitation by 2002, using the Upgraded Family Well, or UFW.

The Mvuramanzi Trust uses cost recovery principles, in that the Trust provides a seed grant of 30% to construct the well, while the households pay 70%. Because the household directly receives the health, time, energy, and other benefits from having the well, most wells are maintained properly without any funding from the government. The UFW's per capita cost is about one-tenth the cost of drilling a borehole and attaching a handpump. With its focus of providing service at the household level, some of the institutional and capacity constraints to cost recovery have been avoided.

Further, as the people pay such a high percentage of the initial capital costs, the seed funding is available to a greater number of communities.

The UFW has many advantages. Maintenance is minimal, and structural repairs are required only occasionally. The basic UFW siphons off spillage into a small plot, which, when used for household use, can irrigate a small plot of land. For an additional cost, UFWs may also be fitted with a pump, which can increase the irrigation size up to eight times. Within Zimbabwe, the UFW has become very widely accepted, and catches on quickly once one or two households purchase one. Households generally are willing to pay up to 80% of the capital cost in addition to the cost of maintenance.

Some of the benefits of having a well at the household level include: more time and energy for women to pursue other activities beyond fetching water; an increased intake of water per household, which yields positive health benefits; and the ability for households to irrigate small plots of land for personal or productive use. Also, by operating at the household level, issues such as ownership of the water and decision making over its use are reduced.

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Still, the goal for 100% access remains distant and the UFW has some problems. Firstly, the UFWs are shallow wells rather than more expensive community boreholes, and so are susceptible to drying up during times of drought. And, while the UFW promotes a more holistic approach to water supply at the household level, the basic UFW often does not provide enough water to be put to productive, income-generating use for the poorest of the poor, who may not be able to afford an additional pump. (There are other financial constraints for the poor, even if a pump is affordable, including high prices for seed and fertilizer, ability to market and distribute products, and so forth.)

It should also be noted that concerns have been expressed about the programme, in that the Trust provides funding on a first-come, first served basis, which may inhibit the poorest of the poor from signing on, as they may lack the initial 70% of total costs. Still, the ongoing success of expanding UFWs throughout the country provides a starting point to meeting the water and sanitation needs of the people, and in providing a point of access for income-generating activities for families.

The UFWs have shown resilience to the economic and political hardships facing Zimbabwe in recent years. With an unemployment rate exceeding 50%, self reliance for sustenance and basic livelihoods has become increasingly important. Without seed corn grants from external support agencies, the rural water supply and sanitation programmes in Zimbabwe would not have made as much progress as they did; as a result of high cost recovery expectations, the seed corn approach was able to impact positively a greater number of Zimbabwe's rural population.

**For further information**

See: [http://www.wsp.org/pdfs/af\\_bg\\_zm\\_wells.pdf](http://www.wsp.org/pdfs/af_bg_zm_wells.pdf)  
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Case study: Kerala project in India

*This case study provides a look at a community that took the initiative to provide itself with safe water supplies, and how that initiative was replicated to cover most of a government district.*

The notion that people in poor rural and peri-urban areas in India are both willing and able to pay for improved water supplies was considered absurd in central government circles through the 1980s. The prevalent thinking was that the poor are unable to pay for water, and therefore water services should be funded and operated by the State. Other assumptions included the ability of the Government of India to solve water services

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problems, and raise and sustain the financial resources required to solve water supply and sanitation access problems.

During the 1980s and into the 1990s, the Olavanna Gram Panchayat (GP) in Kozhikode district in the southern Indian state of Kerala, suffered from a lack of reliable and safe water sources. The Kerala Water Authority (KWA) was responsible for providing water and sanitation to Kerala's six Gram Panchayats. (A Gram Panchayat is the village-level government body that is comprised of elected representatives from one or more villages.) KWA provided networked service to 1,600 households through one water scheme, although financial and institutional constraints prevented it from expanding the network to serve Olavanna's greater population of 50,000. As a result, many poor women spent up to five hours a day fetching water from nearby streams and wells of questionable quality.

After residents picketed the Gram Panchayat office, the KWA provided Olavanna with an additional piped water system that distributed water to public standpipes. This project served 400 households and was funded by state grants. Still, thousands of households were left without a safe water supply, and the people were informed that state budget constraints prevented further improvements.

As a result, a few people organized themselves to self-finance the costs of pumps and intake wells for small groups of households. With each success, more households grouped to self-finance their water supplies, and eventually 54 of these household groups formed a cooperative to provide organizational and financial structure to the process. The formation of the cooperative also served to legitimize their operations and promote development of additional cooperatives.

In the beginning, each house contributed 4,500-12,000 rupees (roughly US\$95-250) in capital costs for a piped water scheme, and 5-10 rupees (US\$0.10-0.20) per month for operation and maintenance. Now, costs vary depending on geographic and other variables. Connection costs are flexibly designed, such that users may pay in instalments over an agreed period of time. In some schemes, the poor are given an opportunity to help defray the costs by contributing labour during construction. Although no money is set aside for depreciation or expansion, the cooperatives have been able to operate at a surplus.

As the success of the system has grown, the policy framework in India has shifted toward a more decentralized approach. The KWA, which was initially unsupportive of the system, as the cooperative was perceived as an affront to its authority, has become more accepting. Now it plays a supportive role, facilitating the scheme's expansion to include more communities and households. Olavanna's Gram Panchayat also plays a facilitating and regulatory role, providing annual reviews for the cooperatives under its jurisdiction. Due to groundwater constraints, the GP has also developed rules and limits for extraction with stiff penalties for excess water use. The GP also encourages metering and volumetric-based charges, which are generally followed.

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Thus, what started in response to a lack of available finance has now developed into 35 separate cooperative schemes, benefiting 10,000 households – roughly the entire population of Olavanna. With decentralization policies in place, the GP is able to provide up to 50% of the capital costs for households that are unable to afford them. As of 2000, the monthly costs of water supply have risen to 30-40 rupees per month (US\$0.60-0.80), due to the rising costs of electricity. However, user fees are capped at 50 rupees per month (roughly \$1.00).

**For further information**

See: [http://www.wsp.org/pdfs/sa\\_olavanna.pdf](http://www.wsp.org/pdfs/sa_olavanna.pdf)  
Contact: Olavanna Gram Panchayat  
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Case study: Slum upgrading in Tamil Nadu, India

Tiruchirappalli City, located in the state of Tamil Nadu, India, has 155 slum areas that house 115,000 people. Poor maintenance and sporadic investment has led to an objectionable state of water supply and sanitation services.

In the mid 1980s, the Municipal Water Corporation, a State entity, built community latrines for the slum areas; however these were poorly managed and maintained, and fell into disrepair. Consequently, users instead chose locations around the latrine or even on the riverbanks to defecate, which impacted public health. Still, the people were not supportive of an idea for the Municipal Water Corporation to build more latrines, expecting that the funding would support building the latrines, rather than maintaining them.

A local NGO, Gramalaya, which worked with eight slums in Tiruchirappalli City, and which is affiliated with WaterAid, discussed the situation with women's self-help groups, including how a system could be better managed, and how it could be funded. They intended to fund a programme to demolish the existing latrines and build new ones, with women's self-help groups to provide maintenance.

In one of the meetings with the groups, a scheme was suggested to install a pay-and-use toilet – charging users for the maintenance fees (such as cleaning materials, cleaners, and a ticket issuer/watchman) and to use the facility. After assessing the costs, it was decided that 50 paise (US\$0.010) per use would be enough to support recurring costs.

With the help of WaterAid, which provided Gramalaya with a grant of close to US \$8,000 (380,000 rupees), the scheme was able to construct latrines in each of the 8 slum areas that could serve up to ten women and ten men, along with a child-friendly stall. The latrine used existing infrastructure from the previous latrines built by the Municipal Water Corporation and, if soak pits were unavailable, WaterAid provided additional funding to cover those capital costs.



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Under this new structure, the self-help groups organized into Sanitation and Hygiene Education (SHE) teams to maintain the latrines. A paid watchman/ticket issuer was hired, along with cleaners. Bank accounts were opened under each SHE team's name for the collected money. The SHE teams keep a ledger to track the number of people who use the facility and the amounts of money collected, and money is deposited each week into the account. Every month, each SHE team hosts a meeting to disclose the details of deposits and expenses of the account to the community, to build trust and accountability through transparency.

Overall, the programme has been a success. On average, 300-600 people use the toilets every day, generating 150-300 rupees per day for the system. Users frequent the latrines because they are clean and safe. All the SHE teams report surpluses in their accounts, which have been used to finance construction of a community hall, domestic drains, street water taps, street lighting, rubbish bins, and other health and sanitation activities. Equally promising has been the use of the SHE teams' surpluses as loans to support the capital costs of building latrines in other slum areas, reducing dependence on grant funding for start-up. Members of experienced SHE teams are often asked for advice on establishing new latrine schemes.

On the other hand, the Municipal Water Corporation has not expressed support for the pay-and-use latrine scheme, and policy frameworks have not adjusted to scale up the success or lend further encouragement.

**For further information**

See: [http://www.wateraid.org.uk/site/what\\_we\\_do/case\\_studies/76.asp](http://www.wateraid.org.uk/site/what_we_do/case_studies/76.asp)

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## Case study: Marinilla, Colombia

*This case study presents a good look at how decentralization and private sector participation (with a domestic company) can be to a community's benefit for improved water and sanitation services in rural areas.*

Although decentralization alone will not improve cost recovery in the water sector, as an institutional framework, decentralization places more decision-making authority in the hands of those who bear the consequences of those decisions. It should come as no surprise, then, that demand-responsive approaches under a decentralized scheme tend to have a positive impact on cost recovery and sustainability. A large factor in this success, however, depends on the capacity at municipal level to assume management and financial responsibilities.

Marinilla, Colombia is located about 50km from Medellin, a major city, and has a population of 26,000, with an average growth rate of 3.5%. The population is well educated, with higher-than average incomes, and the level of social capital is high.

As a result of the 1994 Public Services Law, the Colombian federal government shifted from running the water sector to a regulatory and oversight role. The law devolved responsibility to local government, with the provision that local government also secure capital for investments. Until 1997, a regional agency, Acquantioquia, owned and operated the water services assets in Marinilla and several other municipalities. In 1997, Acquantioquia awarded a management contract to a domestic private sector firm, Conhydra for some of its municipalities, including Marinilla.

The people of Marinilla were actively involved in developing the management contract, and negotiations for services led to a relatively clear and transparent contract that defined the roles and responsibilities of the interested parties. While the municipality, which is run by a mayor and a city council, is responsible for planning objectives for financing, monitoring, operations, performance targets, and supervision, Conhydra has an incentive to improve service levels and billing structures, as well as reduce unaccounted-for-water, as the company's profit margin depends on it.

Conhydra's commitment to the community is high, and the company both hosts and attends regular meetings on formal and informal levels. It also provides regular information about the water system to consumers, and runs educational campaigns for hygiene and proper water use.

Since the start of Conhydra's management contract, an additional 3,500 people have been connected to the system; unaccounted for water has decreased; service levels and water quality have improved; existing infrastructure has been upgraded; and a longer-term investment plan is in the process of implementation. All connections are metered, and service is provided 24 hours a day to 99% of the population. This involvement has also

resulted in a higher-than average cost recovery rate: 84% of the population pays their bills (Figure 9).

Figure 9: Comparative Profile

	<b>Columbia</b>	<b>Marinilla</b>
Gross revenues used for operating expenses	90%	79%, with the balance used to amortize previous loans and invest in infrastructure
Rate of collection	<70%	84% (1999)
Unaccounted for water	45%	41%
Coverage	NA	99%, 24 hours per day/7 days a week
Wastewater treatment	Neglected	90% with sewerage system; treatment plants part of long-term planning objectives
Tariff	<ul style="list-style-type: none"> <li>• Covers &lt;1/3 of real costs</li> <li>• Fixed fee + three levels of per-unit rates, and six socio-economic categories for residential/commercial/industrial users</li> <li>• Full cost recovery the onus of local governments by 2004</li> </ul>	<ul style="list-style-type: none"> <li>• Fixed charge: US\$2.50/month</li> <li>• Average price of water: US\$0.15/m<sup>3</sup></li> <li>• Average monthly bill (water and sewerage): US\$8.25</li> </ul>

Source: [http://www.ehproject.org/PDF/Strategic\\_Papers/LACDEC/Marinilla\\_Colombia.pdf](http://www.ehproject.org/PDF/Strategic_Papers/LACDEC/Marinilla_Colombia.pdf)

Revealingly, Marinilla developed a master plan to project its water needs – for both water supply and sanitation – using an outlook of 20 years with a base year of 1998. The municipality considered total investments required and developed two phases for water sector development. Total investments for this 20-year period, both to maintain and replace infrastructure, are estimated at US\$5 million. Phase I places a focus on the downtown area, rehabilitating the water and sewerage networks, in addition to adding capacity at the drinking water facility. Further, although 90% of the population has access to sewerage networks, the community lacks a treatment facility, so sewage flows directly into a river outside the community. Phase I addresses this by financing a new treatment facility.

Funding for these projects is not reliant on user-finance; instead, Marinilla will rely on government transfers to the municipality (20% of all government support to municipalities is earmarked for water sector development as a result of the 1994 Public Services Law), a grant from CORNARE, Colombia's environmental protection agency, a grant from the Ministry of Economic Development, and a short-term loan from Conhydra, made possible as a result of the system's surplus revenues.

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**For further information**

See: [http://www.ehproject.org/PDF/Strategic\\_Papers/LACDEC/Marinilla\\_Colombia.pdf](http://www.ehproject.org/PDF/Strategic_Papers/LACDEC/Marinilla_Colombia.pdf)

Contact: Fred Rosensweig  
Environmental Health Project (EHP)

Email: [rosensweigf@ehproject.org](mailto:rosensweigf@ehproject.org)

Case study: Mauretania

*This case study looks at the development of small-scale entrepreneurs to address water services needs, and is based on a study programme of the “cessionnaires” in Mauritania*

Small-scale independent providers of water services often fill the gap between what a larger utility is able to provide and the demands of local communities, by providing water supply at a local level at competitive rates. While in most places, small-scale providers provide unregulated service, in Mauritania these providers were promoted through government decree.

In 1993, the government of Mauritania decided to decentralize management of water supply systems in small towns to local private operators, called “cessionnaires”. Although the law allows for municipalities and communities also to take on the responsibility, control is almost entirely in the hands of the private sector. In the last ten years, concessionaires operate in 190 of the 270 small towns that are equipped with water schemes.

Under the system, concessionaires are bound by a contract to provide water services for a community on a yearly basis (if it is a diesel-powered system) or on a monthly basis (if it is a solar-powered system). Contracts are somewhat loose, which has allowed for some flexibility between the operator, the community, and the local water department that previously operated the scheme. As a result, political and social factors tend to guide the contract on an informal basis, such that informal mechanisms between the community and the concessionaire keep each other in check. The smallness of the concession area also affords a level of personal service between the concessionaire and the users.

The concessionaires operate under cost recovery principles, requiring users to pay for their water supplies based on volume. Initial capital costs were paid by the State through government investment plans. However, in those communities which installed solar systems to provide energy for pumping, users assumed 25% of the capital costs. As the systems have grown, communities or the concessionaire are required to provide the financing, without assistance from government or external donors.

Self-financing is difficult, as the concessionaires are unable to obtain credit to finance expansion. Still, individual communities have been able to expand their water systems for domestic use in a variety of different ways: rich individuals in towns sometimes provide funding; migrant remittances may provide the funds; or an economic group (such as a

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farmers' cooperative) that needs access to water for productive use may provide the funds which then also provide water for domestic purposes.

The current regulatory structure instructs the Water Department to maintain the networks, paid for through a tax that is charged to consumers through the concessionaires. Over time, however, the Water Department has not proven a reliable partner, at least partially due to the lack of materials, vehicles, spare parts, and network of trained staff to perform maintenance duties throughout the country. Consequently, the concessionaires tend to conduct maintenance themselves, and have assumed greater responsibilities for the systems than originally envisaged. Many concessionaires have developed into a broader enterprise, with commercial and technical staff. Further, most of the concessionaires are professionals with formal education, with a very low staff turnover rate.

**For further information**

See: [http://www.wsp.org/pdfs/smv\\_mauritania.pdf](http://www.wsp.org/pdfs/smv_mauritania.pdf)  
Contact: Water and Sanitation Program - West and Central Africa  
Corner of Booker Washington and Jacques AKA Streets  
Cocody, Abidjan, 01,  
Cote D'Ivoire  
Tel: +225 22 400 400  
Email: [wspaf@worldbank.org](mailto:wspaf@worldbank.org)

Case study: Rand in South Africa – ODI

*The following case looks at a public-public partnership in the North West province of South Africa and the importance of community involvement –on behalf of both the operator and consumers – to achieving improved cost recovery.*

Although much attention has been paid to a management structure involving private sector participation, public-public partnerships are also being developed to promote water sector development in developing countries. In the Odi area of South Africa's North West province, near Pretoria, Rand Water, a public sector utility, has signed contracts with municipalities to manage their retail water services. Odi has an unemployment rate of 44%, which is higher than the national average.

Since 1995, a national process has taken place throughout South Africa to create new boundaries for water boards in an effort to negate the impact of apartheid planning and increase sustainability – financially and otherwise. To do this, successful water boards with high cost-recovery ratios are required to expand their services into the poorer areas, which have traditionally received subsidies. Importantly, the subsidies are being phased out, imposing cost recovery charges on people who are not accustomed to paying them.

Rand Water's contract, which lasted from 1996 to 1999, was to improve the financial integrity of the municipal water boards and improve the management capacity of local staff.

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At the end of the contract term, management returned to local authorities, with a goal to improve the viability of each water board.

In the lead up to the project's start date in 1996, specific attention was paid to including the community in preparation decisions, as well as agreeing to certain principles with the community, such as establishing a proper billing and payment system and defining roles and responsibilities for the project throughout the life of the contract. Labour issues were addressed prior to the contract, with participation from the South African Municipal Workers Union (SAMWU), and with a provision that no layoffs would occur during the contract as part of efficiency improvements. New management was added, with a specific goal to train more management staff, to increase the project's effectiveness beyond the terms of the contract. Significant community input was sought on the project's design, and in negotiations technical issues were on an equal footing with other social and institutional considerations.

While this planning process took two years, between 1996 and 1998, payment levels reportedly rose by 400% (note that at the start of the contract, payment levels were almost negligible). To achieve this, all connections were registered with water meters, and all were billed on regular cycles.

To promote and affirm their presence in the area, Rand Water officials attended community functions and held regular meetings with the community, as well as providing educational campaigns on water use and training for staff. This helped to build trust between the company and the community. The company also used local businesses to develop advertising campaigns and other marketing tools to promote cost recovery.

As the national subsidy for water is being phased out, the community faces significant challenges, especially in poorer areas that may be unable to afford the higher tariff levels. Although instalment plans are provided for those who cannot afford to pay, non-payment leads to disconnection, and even confiscation of property. These issues may affect the long-term performance of supply in the Odi area, as elsewhere in South Africa, if unemployment persists and ability to pay declines.

**For further information**

See: <http://www.cps.org.za/execsumm/polbrief15.htm>  
Contact: Centre for Policy Studies  
First Floor  
No 9 Wellington Road  
Parktown, South Africa 2193  
Tel: +27 11 642 9820  
Email: [claire@cps.org.za](mailto:claire@cps.org.za)

Case study: Lusaka, Zambia

*This case study looks at a system of pre-payment cards in a peri-urban area.*

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Chipata is a high density, low-income peri-urban area of Lusaka, the capital city of Zambia. Supply of water comes from groundwater. To address cost recovery, the area has developed a system of monthly prepayment for water supplies. This system was decided upon by the residents of Chipata, and was provided with seed financing from CARE.

Under this system, consumers go to the local committee office and pay a cashier 2,500 kwacha for a pre-paid monthly use card, which allows seven 20-litre buckets/ day per family. Consumers receive their water from communal taps, which are only accessible when attended by employees, who work fixed hours and stamp the card to keep track of use. The limit for consumption was made factoring demand and public health considerations, but also the capacity of the borehole where the taps are installed. Membership and user fees totalling 9,000 kwacha (US\$6.37 as of 1st January 1998) per year are associated with using the service, and can be paid in a lump sum or over time (with no interest). Those who cannot afford the membership fees are excluded from the service, and even members who are unable to pay for a month receive no water. These people are relegated to using alternative, often unsafe sources.

Institutionally, the system is divided into different levels of committees. There are 39 Zone Development Committees (ZDC) that represent the community at its most grassroots level, and have the greatest level of interaction with individual households. The ZDCs are charged with supervising each tap's operation and tap attendants, and reporting problems to the Residents' Development Committee (RDC). The ZDCs elect the RDC, which coordinates compound-wide projects, works with the ZDCs, reports to the Forum of Zone Representatives (FZR), and represents Chipata's system to other government agencies and groups. The majority of these representative positions are volunteers, indicating the community's resolve in maintaining the system. The FZR sets tariffs based on community input, and the RDC has independent signatory to its account from the Lusaka City Council.

To keep track of finances, the system in Chipata has two bank accounts: one for capital replacement costs; the other for operating expenses. Revenues are used to pay for electricity (for pumping), water quality chemicals, staff salaries, capital expenses, and administration. Monthly financial reporting is disseminated to the public as part of an effort to increase transparency and improve community relations. As a rule, 55% of revenue is used to meet capital expenses, while 40% is used for operating expenses, and 5% is reserved for future development costs.

On the whole, the system of pre-paid cards has been successful in Chipata. Household membership in the system increased from 1,041 member-households in July 1997 to 3,182 in March 1998, and the system is financially solvent. The major concerns for this system are possible expansion plans of the Lusaka municipality, which would either take over or dissolve this community-driven system, and the possibility that central government will mandate a free water policy, similar to South Africa's. Given the level of daily use under this system is very basic, and is capped at 20 litres, a free water policy could dismantle the positive benefits the system has created in the area. While other similar systems in peri-

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urban areas have been impacted by political influence, the Chipata system has thus far remained fairly democratic.

**For further information**

See: <http://web.mit.edu/urbanupgrading/waterandsanitation/resources/examples-pdf/MonthlyCardPaymentSystem-ZA.pdf>

Contact: No contact information available.



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## TOP Resources

TOP Books, papers, features

**Boland, John and Dale Whittington. 2000. "The Political Economy of Water Tariff Design in Developing Countries." In *The Political Economy of Water Pricing Reforms*. Oxford University Press, New York.**

<http://www->

[wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2000/08/14/000094946\\_00072705342983/Rendered/PDF/multi\\_page.pdf](http://wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2000/08/14/000094946_00072705342983/Rendered/PDF/multi_page.pdf)

This paper, which is part of an excellent larger book on pricing reform and tariff structure, provides a critical assessment of the increasing block tariffs (IBTs, and in this TOP, simply block tariffs) used in developing countries, and provides an alternative pricing strategy of uniform volumetric pricing with lump sum rebates for the poor. The paper looks at the economics and political background of IBT, provides case studies of cities using IBTs, along with the objectives of water tariff design.

**Brikke, Francois and Johnny Rojas. 2001. *Key Factors for Sustainable Cost Recovery in the Context of Community Managed Water Supply*. Occasional Paper Series No. 32. IRC, The Netherlands.**

<http://www.irc.nl/products/publications/online/op32e/index.html>

This paper walks the reader through all the different steps to approach cost recovery, providing ample check lists, strategy ideas, and possible advantages and disadvantages related to management type. Based on an extensive literature review, the study maps the key issues facing community systems, but also provides practical tools for communities to use. Options for accounting systems and other things to consider when accounting for costs in the water sector are provided, along with annexes with examples of tariff calculations, sample water bills, formats for budgeting, bookkeeping, and so forth.

**Johnson, Eric. 2001. "Long Road to Cost Recovery in Rural Water Supply: Intermediate Steps with a Photovoltaic Installation." *Sustainable Development International*, Edition 4, page 65.**

[http://www.sustdev.org/journals/edition.04/download/ed4.pdf/sdi4\\_65.pdf](http://www.sustdev.org/journals/edition.04/download/ed4.pdf/sdi4_65.pdf)

This paper provides a quick study of the major issues in achieving cost recovery in rural areas. The author starts with the pitfalls of subsidization and overcoming the notion that water is free, and then begins a discussion of the many small steps required in the institutionally complex rural arena to achieve full cost recovery. In isolated areas, solar-powered community water delivery may be the best option. Looking at El Fortin, Honduras, the community installed both technological and social controls to improve cost recovery while providing basic access for the very poor. While the article focuses on cost recovery from an engineer's perspective, issues of capacity, institutional mechanisms, and incentive structures are also addressed.

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**Komives, Kristin and Linda Stalker Prokopy. October 2000. Cost Recovery and Partnership: Results, Attitudes, Lessons & Strategies. BPD Water and Sanitation Cluster, London.**

<http://www.bpd-waterandsanitation.org/english/docs/costrec.pdf>

The Business Partners for Development (BPD) Water and Sanitation Cluster works to develop partnerships between the public, private, and civil society sectors to improve water and sanitation services. Using the experiences gained from the BPD's eight focus projects in countries including Haiti, Indonesia, Bolivia, and South Africa, lessons on cost recovery for the water supply sector are established, drawing from surveys and interviews of community groups and project partners. This study adds insight to the body of literature on cost recovery, as it views the subject through the lens of tri-sectoral partnerships, which provides insight to the biases (positive and negative) that can affect a project's (or sector's) ability to achieve full cost recovery.

**Mehta, Meera. 2003. "Meeting the financing challenge for water supply and sanitation: Incentives to promote reforms, leverage resources and improve targeting". World Bank – Water and Sanitation Program, Washington DC.**

[http://www.wsp.org/pdfs/FINANCE%20REVIEW%20\\_PRESS.pdf](http://www.wsp.org/pdfs/FINANCE%20REVIEW%20_PRESS.pdf)

The study is meant as a guide for those working in the water and sanitation sector and seeking to create stronger linkages between financing and cost recovery aspects with institutional reforms and poverty reduction. The document discusses mechanisms to address several challenges at different levels (from national to local level), in both rural and urban contexts and with a specific focus on the poorest and those who still do not have access to improved services. Several examples from around the world, including cases from other sectors, illustrate each of the mechanisms discussed.

**Terry, Geraldine and Belinda Calaguas. 2003. "Financing the Millennium Development Goals for domestic water supply and sanitation". WaterAid. London.**

[http://www.wateraid.org.uk/site/in\\_depth/in\\_depth\\_publications/](http://www.wateraid.org.uk/site/in_depth/in_depth_publications/)

This publication addresses the major issues relating to financing for the water sector, including the implications of the MDGs and the financing gap. It also proposes strategies for how ODA and other forms of finance could be improved, drawing on examples from a variety of developing countries.

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**United Nations Centre for Human Settlements (UNCHS). 1993. "The Maintenance of Infrastructure and its Financing and Cost Recovery." UNCHS (now Habitat), Nairobi.**

<http://www.unchs.org/unchs/english/mainten/contents.htm>

This publication focuses on the financing and cost recovery of operation and maintenance costs for infrastructure in developing countries. On cost recovery, the paper emphasizes the importance of maintenance costs for sustaining a project, and the general lack of attention paid to these costs during project planning, and considers the key issues related to recovering and financing maintenance costs.

**Waughray, Dominic and Dominic Moran. March 2002. "Cost Recovery in Water and Sanitation Projects." DFID Knowledge and Research Project, London.**

Not yet available online

This paper investigates cost recovery in rural and peri-urban schemes through an exhaustive literature review, a survey on cost recovery, a meta-analysis on willingness to pay literature, and case studies based on field work in India and South Africa. Findings are presented as strategic recommendations for practitioners looking to incorporate cost recovery themes and strategies into the water sector and water projects while retaining a pro-poor and sustainable livelihoods focus.

**Whittington, Dale and John Boland. December 2002. "Water Tariffs and Subsidies in South Asia Paper 1". WSP, USA**

[http://www.wsp.org/pdfs/Water%20Tariff%201\\_press\\_27th%20Feb.pdf](http://www.wsp.org/pdfs/Water%20Tariff%201_press_27th%20Feb.pdf)

This paper, from a series funded by PPIAF, World Bank, World Bank Institute and WSP, on tariff and subsidy issues in South Asia, discusses the objectives of water tariffs, describes the pros and cons of the main types of tariff structures in use around the world, and examines the use of pricing structures to deliver subsidies. The paper concludes that it is difficult and challenging to design tariff structures which are consistent with the many conflicting objectives of the water sector (such as economic sustainability, efficiency, equity and affordability), and that in many cases existing practices introduce distortions and undesirable effects, particularly for poor users.

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TOP Web sites

**Community Self-Management, Empowerment & Development: Cost Recovery, Obtaining Resources to Manage a Water Supply**

<http://www.scn.org/ip/cds/cmp/modules/wat-cst.htm>

This website, developed by Phil Bartle, PhD. and hosted by the Seattle Community Network, posts a training handout on cost recovery in a “cafeteria style” fashion with useful information about cost recovery at the community level. Most of the documents (which are available in French, English and Spanish) are designed to use as handouts at training sessions. The site is a product of the Community Management Programme (CMP) initially funded by Danida and designed by UN Habitat (UN Centre for Human Settlements). The site provides links and cross-references to other related training modules on the site.

**Water and Sanitation for All: A Practitioner’s Companion to Funding and Cost Recovery**

<http://web.mit.edu/urbanupgrading/waterandsanitation/funding/>

This interactive site discusses things like establishing pricing policy, financial mechanisms, setting up payment systems and improving collection rates. Objectives for financing cost recovery are laid out, and specific actions are listed to help meet the objective. Tools are provided, along with case studies that offer examples of different types of funds and cost recovery mechanisms.

**Sanitation Connection: Resources on Financing and Cost Recovery**

<http://www.sanicon.net/titles/topiclist.php3?topicId=13>

Prepared by the Water and Sanitation Program for South Asia this website provides an introduction to financing and cost recovery, along with a list of publications that focus on finance and cost recovery. Documents are accessible through Sanitation Connection, a network of initiatives and resources to facilitate access to information on sanitation issues. Given the lack of attention paid to sanitation services in developing countries, this site provides a good start to thinking about the issues related to financing sanitation, and how these compare with water supply services.

**The World Bank’s Rural Water Supply and Sanitation Page**

<http://www.worldbank.org/html/fpd/water/rural.html>

Rural areas pose unique challenges for the water and sanitation sector. This site offers basic principles for rural water and sanitation services projects, along with some good publications and resources on the topics of demand-responsive approaches, management options and promoting sustainability.

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### **World Bank Rapid Response Unit: Papers & Links on Water Pricing and Subsidy Policy**

<http://rru.worldbank.org/Resources.asp?results=true>

The Rapid Response Unit provides information on a variety of topics related to infrastructure, with a focus on investment climate and privatization. On the site, a section devoted to subsidy policy and pricing within the water sector has mini-reviews of websites and papers related to this aspect of cost recovery. The site also has a free helpdesk for information, along with fee-based services for more specialized reports. Reviews and links to World Bank Toolkits, and literature reviews on topics such as output-based aid, economic growth and poverty alleviation, and corporate governance round out the site. A “hot topic” feature provides a moderated web-based discussion forum.

### **World Bank Urban Development: Upgrading Urban Communities website**

[http://www.worldbank.org/html/fpd/urban/urb\\_pov/up\\_body.htm](http://www.worldbank.org/html/fpd/urban/urb_pov/up_body.htm)

Although this site does not have a strong focus on cost recovery, the processes for slum upgrading require a review of socio-economic impacts and issues including cost recovery for basic infrastructure services such as water and sanitation. The website includes a ten-country assessment report on urban upgrading in Africa, and information about existing and proposed projects that emphasize affordability, cost recovery, and replicability.

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## TOP Toolkits

### **Global Water Partnership ToolBox on Integrated Water Resources Management**

<http://www.gwpforum.org/servlet/PSP?iNodeID=103&iFromNodeID=2400>

The Global Water Partnership's mission is to partner government agencies, public institutions, private companies, professional organizations, and multilateral development agencies to establish the principles of sustainable water management; identify gaps and stimulate partners to meet their needs given their resources; support action at the local, national, regional and river-basin levels to promote sustainable water resources management; and to help match needs to available resources. Their toolkit, developed in collaboration with the Netherlands Water Partnership, aims to facilitate implementation of Integrated Water Resources Management through organizational tools, virtual dialogues, databases of information, and other media. A section on financing initiatives includes information on cost recovery and charging policies (along with related tools) with lessons learned and cross-references to other topics.

### **Operation and maintenance of rural water supply and sanitation systems. 2002.**

**World Health Organization. Prepared by Francois Brikke.**

[http://www.who.int/water\\_sanitation\\_health/wss/O\\_M/Rural.htm](http://www.who.int/water_sanitation_health/wss/O_M/Rural.htm)

Unit 5 of this useful course on rural water supply and sanitation systems provides an overview of the main points of cost recovery. Written by Francois Brikke, the lecture covers his seven key principles of sustainable cost recovery, and provides a plan for facilitators about how to run small and group exercises on financial management within the water sector, designation of responsibility within a water scheme, and developing sustainable financial arrangements.

### **Water Prices in CEE and CIS Countries: A Toolkit for Assessing Willingness to Pay, Affordability and Political Acceptability. March 2002. Danish Ministry of the Environment.**

<http://www.ebrd.org/country/sector/muninfra/toolkit/toolkit.htm>

The Danish Ministry of the Environment published this toolkit to present tools to quantify households' affordability and willingness to pay for water and wastewater. It includes lessons for both public-private partnerships and traditional investment projects. Topics covered include: how to assess the risk of non-payment; political resistance to tariffs for water services; how to assess whether the criteria for grants from bilateral and multilateral agencies are met; design issues for tariffs and subsidies; and working with the public to promote an understanding about the nature of water tariffs. The toolkit also presents case studies from CEE and CIS countries on small towns, infrastructure design, demand-responsive approaches and the need for willingness to pay studies; and how to develop a methodology to assess households' ability and willingness to pay for water services.

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### **World Bank Toolkits for Private Participation in Water and Sanitation**

<http://www.worldbank.org/html/fpd/water/wstoolkits/index.html>

These three toolkits address “Selecting an Option for Private Sector Participation,” “Designing and Implementing an Option for Private Sector Participation,” and “What a Private Sector Arrangement Should Cover.” While cost recovery is not a focus of these toolkits, it is addressed in the context of designing private sector participation projects and contracts. These toolkits are intended more for peri-urban and urban areas than for rural areas.

### **Water Utility Partnership Toolkit**

[www.wupafrica.org](http://www.wupafrica.org)

The Water Utility Partnership for Capacity Building in Africa (WUP) was launched in 1996 with assistance from the World Bank. The goal of the WUP is to create a partnership among African water sector utilities and other key institutions to discuss opportunities and share learning to increase capacity building. The WUP seeks to accomplish this by developing performance indicators of African water utilities, building support for better utility management and reduction of unaccounted-for-water, and a focus on pro-poor urban water sector development. As part of their efforts, they have developed a toolkit that provides information about different techniques to facilitate decision-making at the urban level for increased access to water and sanitation. The toolkit is divided into five categories: policy and legal issues, service delivery, customer outreach, institutional arrangements, financing, and hygiene education.

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TOP Past and future conferences/events

**Financing Water Services for the Poor, September 23, 2002-March 22, 2003.**

[www.worldwaterforum.org](http://www.worldwaterforum.org)

Organized by the Global Water Partnership and the World Water Council, and moderated by James Winpenny and Daniel Valensuela, this e-conference was part of the Third World Water Forum's Virtual Water Forum. The focus was threefold:

- To create an enabling environment for financing the water sector
- To finance water for people
- To finance water for food

A background paper to the virtual forum can be found at

<http://www.worldwatercouncil.org/download/VWF-finance-background.pdf>

For additional information contact James Lanahan at [James\\_Lanahan@sida.se](mailto:James_Lanahan@sida.se).

**E-conference on scaling up community management of rural water supplies: "Beyond the Community". 3 June – 12 July 2002. IRC International Water and Sanitation Centre and the Water Supply and Sanitation Collaborative Council (WSSCC) in cooperation with WaterAid, PLAN, WEDC and SKAT.**

<http://www.irc.nl/manage/debate/econf.html>

This conference looked at management of water and sanitation services at a community level, with an intention to share ideas, identify mechanisms to scale up community management in rural areas, to identify obstacles to scaling up, and to identify good and bad practices. The conference website hosts summaries of all six weeks of dialogue, along with a background paper explaining the major issues facing scaling up rural community water systems, including cost recovery.

**International Conference on Water and Sanitation Services in Small Towns and Multi-Village Schemes. June 11-15, 2002. Water and Sanitation Programme, Addis Ababa, Ethiopia.**

[www.wsp.org/english/afr/addis/addis\\_desc.pdf](http://www.wsp.org/english/afr/addis/addis_desc.pdf)

This conference considered the unique challenges of providing water and sanitation services in small towns, which have different characteristics than urban or rural areas. The Water and Sanitation Program's Small Towns and Multi-Village Systems Initiative conducted a series of studies on small towns, including management options, financing opportunities, methods for cost-effective project design, etc. over the last few years. This conference's objectives were to share experience among specialists, while reviewing the findings of the Initiative, and launch a second stage of development, which is expected to develop tools for application and other research.



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**World Bank Institute Workshop for Journalists. March 25-29, 2002. Johannesburg, South Africa.**

<http://www.worldbank.org/wbi/sdwatermedianetwork/africa.html>

This workshop, sponsored by the Institute for Advancement of Journalists (IAJ), featured a field trip to a local river, and included discussions on policy frameworks for water provision, responsibilities of local governments and Water Service Providers, implementation of the “free basic water policy”, health and hygiene issues, the cholera outbreak in rural areas, and cost recovery/non-payment issues.

**E-Conference on Toolkit for Improved Water Supply and Sanitation Services among the Urban Poor, July 1-31, 2000. Hosted by the Water, Engineering and Development Centre (WEDC), Water Utility Partnership, Water and Sanitation Program, and Water Supply and Sanitation Collaborative Council**

[http://www.wsp.org/english/afr/calendar\\_econf.html](http://www.wsp.org/english/afr/calendar_econf.html)

This e-conference was held to assist water sector practitioners and policy makers in low income, urban areas of Africa with practical tools for decision-making. Topics were facilitated by experts in the field, and included the following:

**Strengthening Utility Outreach to the Poor – Customers and Providers**  
**Undertaking WSS Reforms to Benefit the Poor – Policies and Legal Aspects**  
**Making Tariffs and Subsidies Work for the Poor – Funding and Cost Recovery**  
**Innovating to Serve the Poor – Levels of Service**

The discussion on Cost Recovery focused on how water services might be financed to meet the needs of the poor, along with designing flexible payment systems, extending coverage to informal and poor areas while recovering costs, and the role of subsidies and tariffs.

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## TOP Research programmes

### **PIRENE Project – Integrated Research Programme on Environment – Water**

[http://www.iag.ucl.ac.be/recherches/cese/research/PIRENE\\_int\\_res\\_prog\\_env\\_water.htm](http://www.iag.ucl.ac.be/recherches/cese/research/PIRENE_int_res_prog_env_water.htm)

This programme, coordinated by the Centre Environment at the University of Liège and financed by the Walloon Minister for Land Use Planning and Environment (Belgium), was started in November 2000 to provide public authorities in Walloon with tools for decision-making at a regional level (for Walloon). Although the programme has a focus on a more hydrological level, the economic implications, especially as concerns the EU Water Framework Directive for cost recovery, are included.

### **IHE-Delft Department of Municipal Infrastructure, Waste Water Core**

<http://www.ihe.nl/mui/default.htm?mui/index.htm>

The Waste Water Core seeks to train wastewater professionals in how to support efforts to provide access to sanitation in developing countries. The core group studies different technologies for waste water treatment, but also considers the economic, social, and physical context of providing wastewater and sanitation systems within a demand-responsive system and hygiene education.

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TOP Training courses

**CREPA – Centre Régional pour l'eau Potable et l'Assainissement with IRC and Streams of Knowledge**

**Pour un Recouvrement Durable des Coûts: Analyse et Planification dans le contexte de l'AEP communautaire, rural et péri-urbain**

**22 March – 2 April 2004, Ouagadougou, Burkina Faso**

Ce cours vise à fournir un aperçu des facteurs clés pour le recouvrement durable des coûts pour les services d'approvisionnement en eau des communautés et à permettre aux participants d'élaborer une tentative de stratégie et de plan d'action pour le recouvrement des coûts dans leur propre contexte.

Groupe Cible: Gestionnaires hautement qualifiés, promoteurs, agents de développement, chefs de projets, cadres des services techniques de l'administration et des ONG et des formateurs intéressés à partager et apprendre des expériences et à identifier les voies prometteuses pour planifier le recouvrement des coûts dans les services d'approvisionnement en eau des communautés.

Contact Eva Koussi for more details: [crepa@fasonet.bf](mailto:crepa@fasonet.bf)

**TREND Training, Research and Networking for Development with IRC and Streams of Knowledge**

**Planning for Sustainable Cost Recovery**

**October/November (to be decided) 2004, Ghana**

This course aims at providing an outline of the key factors for sustainable cost recovery of water supply services for communities and at enabling participants to work out a strategy and action plan for cost recovery in their own context.

Target group: Highly qualified managers, promoters, agents of development, project managers, technical staff of government engineering departments and NGOs and trainers interested to share and learn from their experiences and to identify potential ways to plan for cost recovery from community water supply services.

This course has been offered on an annual basis since 2000. Other potential partners interested in offering the course in other regions and languages are being sought.

For more details, contact : [trend@ghana.com](mailto:trend@ghana.com)

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A.J. James holds MA and Mphil degrees in Economics, from the Delhi School of Economics and holds a PhD from the University of London. Since 1996, he has been working on water issues, first as a Visiting Fellow at the Institute of Economic Growth, Delhi, then as the Principal Consultant (environmental and Resource Economics) at Ecotech Services (India) and (since 1998) as an independent consultant economist. He helped design, supervise and execute one of the first full-fledged contingent valuation surveys done in India (in 10 cities all over the country), to estimate household willingness to pay for cleaning the river Ganges (with professors Anil Markandya and M.N. Murty). He has also independently conducted CV studies, estimating household willingness to pay for better water supplies. In 1999, he did a situational analysis of such demand assessment studies in India for the Water and Sanitation Program. He also studied private water societies for improved water supplies in rural India (Olavanna in Kerala), a community managed rural piped water scheme and private public partnerships for O&M of a water pipelines, in order to prepare Field Notes published by the Water and Sanitation Program.

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Belinda Calaguas is WaterAid's Advocacy Manager. In this capacity, she undertook to develop WaterAid's international advocacy programme, which now includes a programme of research, documentation, lobbying and UK-based as well as international advocacy on water and sanitation services for the poor. Belinda is also co-ordinating WaterAid's work on water and poverty. Belinda used to work on migrant and refugee issues in Britain. Before that she was involved in issues affecting farmers, women and the urban poor in the Philippines, in various capacities as researcher, trainer, campaigner and advocate.

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Dr Cyrus Njiru is Research Manager at the WEDC Institute of Development Engineering, Loughborough University in the UK. A Chartered Civil/Water and Sanitary Engineer, and also a Chartered Water and Environmental Manager, Cyrus has considerable water utility management experience. He is currently involved in research in the general area of water supply and management, focusing on financial and institutional aspects of service delivery. He has experience and research interests in financing and cost recovery, and has recently undertaken research on pricing and service differentiation, and investigated application of marketing principles in water services management.

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Since 1986 Dale Whittington has worked for the World Bank and other international organizations on the development and application of techniques for estimating the economic value of environmental resources in developing countries, with a particular focus on water and sanitation policy issues. He has designed and carried out environmental valuation studies in Haiti, Nigeria, Ghana, Liberia, Kenya, Uganda, Ethiopia, Mozambique, Tanzania, Pakistan, China, Philippines, Indonesia, and Ukraine, and Bulgaria. His current research focuses on the development of planning approaches and methods for the design of improved sanitation systems for rapidly growing cities in developing countries, and the design of municipal water tariffs.

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Derek Hazelton is the Manager of TSE Water Services, a small consultancy based in South Africa, which he founded to focus on policy, planning and in-the-field issues affecting the sustainability of water service in areas where affordability, institutional and managerial capacity, and skills availability are critical constraints, and at the local/district authority and community levels. Mr. Hazelton has conducted studies and has written about South Africa's free water policy, along with field evaluation of unconventional water cost recovery systems for South Africa's Department of Water Affairs, and has presented widely on issues of successful cost recovery and tariff design.

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Dominic is Senior Natural Resource Economist at the Scottish Agricultural College in Edinburgh and a Research Fellow at the Centre for Social and Economic Research on the Global Environment at the University of East Anglia. He specializes in the assessment of demand and willingness to pay for water and sanitation services and the role of demand assessment in the design of public-private partnership arrangements for supply in developing countries. His research interests remain split between developed and developing countries; covering the economics of agro-environmental policy, forest economics, water management and biodiversity conservation. He is currently undertaking a large-scale project for the Scottish Executive to determine public preferences for agricultural outputs in Scotland.

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Mr. Waughray is a Partner with Environmental Resources Management, a major international management consultancy specialising in environment, economics, and social aspects of development. He has eight years' experience in the economic and financial analysis of natural resource development projects, particularly for water and waste investments. This includes assessing demand to develop cost recovery strategies, undertaking cost benefit and cost effectiveness analyses, and recommending economic, regulatory and institutional policy reforms to decentralize services, promote cost recovery and encourage private sector participation. He also possesses project management skills and experience, including team and financial management, project development, design, planning, implementation and evaluation, and in the use of PRA/ RRA methodologies.

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For the past 15 years Eric Johnson has been involved in the fields of small-scale rural water supply, sanitation, and alternative energy use. He has spent four years as a water/sanitation trainer with ENTRENA, S.A. based in the Dominican Republic, and currently works as an independent consultant in the Central American and Caribbean region. He provides technical and programme support to Enersol Associates, a non-profit organization focussed on renewable energy, and during the last two years he has served as a representative of the Environmental Health Project (EHP) in the Dominican Republic, aiding in the implementation of several components of USAID-funded institutional assistance to the national rural water supply agency there. He also recently served as an

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Eva is a Sanitary Engineer specialized in Utilities Management at Unesco-IHE Institute in Delft (Netherlands). He works in several water and sanitation areas in West and Central Africa . His main areas of research are cost recovery and urban water utilities finances. His other interests include fundraising for water and sanitation as well as public private partnership development. He is the main facilitator of the Financing and Cost Recovery annual training courses at CREPA.

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François is a Senior Economist and a Sanitary Engineer working as an independent consultant and an associate of IRC, International Water and Sanitation Centre. He specialises in the formulation and evaluation of water and sanitation programmes at national and regional levels, with an emphasis on decentralization, public-private partnerships, operation & management, community management and cost recovery issues in developing countries. His other interests include the design of participatory processes and training events on the above-mentioned issues. He is the author of several publications that address financing and cost recovery.

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Phil Bartle is a specialist in poverty reduction, micro-enterprise, capacity development and community participation methods as they integrate with other key elements of the assistance and development process. He has worked on development issues in Africa, Europe, North America and Asia for over thirty years, specialising in community based development, management training and skills transfer, and capacity building through a participatory approach. Phil has also developed an Internet website on a variety of



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development issues, including cost recovery, that includes training materials, reports, links to other sites, a data base, and informal material.

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Vivien Foster is a Senior Economist in the Office of the Director for Finance, Private Sector and Infrastructure in the Latin America and Caribbean Region of the World Bank. Her work involves both analytical and advisory services, and economic input into the design and supervision of projects, with a focus on the impacts of infrastructure reform and privatization on the poor. Before joining the World Bank, she was a Managing Consultant of Oxford Economic Research Associates Ltd in the UK where she advised private and public sector clients in the water and energy industries, and worked with numerous Latin American governments on issues relating to water sector reform. She holds a Doctorate in Economics from the University College London.

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## Glossary

<b>Term</b>	<b>Definition</b>
Ability to pay <sup>24</sup>	A measure of whether individuals or communities are able to pay for services, given levels of unemployment, other indicators of poverty, and social capital. Also see Willingness to pay.
Cost of Operations	Generally, the costs of daily operations. Includes employment costs, cost of materials, power costs, and any costs of hired or contracted services.
Capital Costs	Those costs necessary to ensure that the system's assets (e.g., an aquifer, hand pump, distribution mains, pumping stations, etc.) achieve continued quality and continuity of service in the present and the future, represented as the costs of replacing those assets in a given year (for above-ground, or short-term assets), and using other accounting provisions (including historic cost and depreciation methods) for longer-term assets, such as aquifers or dams.
Cost of Servicing Capital	The minimal return that providers of capital (governments, IFIs, other donors and lenders) require for a water project or programme in order to feasibly provide funding, given the level of risk.
Cross Subsidy	A mechanism whereby one category of consumers subsidizes another category of users – can be either industrial to residential; wealthy to poor – within a network. Cross subsidies can also be used to connect new users by charging a surplus to existing customers.
Decentralization	An institutional and financial arrangement where power is distributed from a central authority to regional and local authorities.
Demand-responsive approach	A development process whereby communities are valued as consumers, and have an opportunity to express demand for systems and services, and determine specific components (technical, institutional, financial) for these.

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<sup>24</sup> <http://www.irc.nl/content/view/full/3733>

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<b>Term</b>	<b>Definition</b>
Depreciation	The reduction of the value of a capital good (asset) due, for instance, to use over time or technological obsolescence), expressed as part of financial cost recovery.
Direct Subsidy	Subsidy process where a government directly pays a portion of poorer consumers' water bills.
Economic cost recovery	An economic cost recovery perspective considers the financial costs of supplying water in addition to the opportunity and environmental costs to society of ensuring the supply and the broader water resources environment that might not be accounted for as part of cash flow.
Environmental costs	Costs related with the impact on the environment of providing a water supply. For instance if pollution of the water source has an impact in public health or in the ecosystem.
Financial cost recovery	Considers the financial costs of a system or service in an isolated fashion, such as operations and management (O&M) costs, capital costs, investing for future growth and rehabilitation, and perhaps some level of profit.
Opportunity Cost	The value of a good (or service, investment, or policy) that is forgone by choosing an alternative action. For instance the fact that by using water for some purposes may deprive other users of water. The same applies to the time saved by women collecting water which can be used for productive or other uses.
Marginal Cost	The extra total cost of providing an additional unit of water
Social Capital	A measurement of the norms and networks that enable collective action within communities
Willingness to pay	An expression of demand for a service. Some methods are used to determine willingness to pay: (1) Actual payment habit studies; (2) Initial contribution to investment; (3) Actual behaviour studies.

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## About the authors

This TOP was written by Rachel Cardone of Environmental Resources Management, and Catarina Fonseca of IRC – International Water and Sanitation Centre, based on both ERM's and IRC's experiences with water policy and economics.

ERM's International Development Team has a strong track record in providing integrated consultancy services to a broad range of clients in the water and sanitation field, including NGOs, international and bilateral development agencies, and the private sector. The team has a particular strength in finance and cost recovery issues, and has recently published a report on cost recovery for DFID, and designed the financing strategy for the EU Water Initiative. Additionally, the IRC's experience in evaluation and training missions, conferences and thematic groups, and eight years of work with community management in 22 communities in 6 countries has been invaluable to the writing of this publication.

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Rachel Cardone has a MPA in Energy and Environmental Finance from Columbia University's School of International and Public Affairs, and holds a BA in history with a minor in anthropology from the University of Michigan. At ERM, she works on water economics and policy issues within the broader framework of sustainable development. Much of her current work relates to financing the water sector to meet development goals whether at the country, regional, or global levels. She has also worked on issues relating to community driven development in Sub-Saharan Africa. Rachel publishes a regular column, "Wall Street on Water," for the American Water Resources Association's Magazine, Impact, and has published two books on the water industry, each of which mapped out the contextual issues surrounding private sector development, one from a global perspective, the other focussed on the Middle East/North Africa.

### ***Catarina Fonseca***

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Catarina Fonseca has a MAs in Development Studies specialized in agriculture and rural development (the Hague, Netherlands) and originally trained as an economist (Lisbon, Portugal). One of her activities at IRC is to research and disseminate information and advocacy materials concerning Community Water Supply Management and specifically Financing and Cost Recovery. She coordinates the theme supervising several activities such as the publication of this Thematic Overview Paper, the production of case studies on key issues where there are knowledge gaps and the development and facilitation of training courses on the theme together with partners in the South. She is co-author of the publications, "Keep it Working: a field manual to support community management of rural water supply" and "Challenges for the intermediate level: post construction support for community managed water supplies".

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## About IRC

IRC facilitates the sharing, promotion and use of knowledge so that governments, professionals and organisations can better support poor men, women and children in developing countries to obtain water and sanitation services they will use and maintain. It does this by improving the information and knowledge base of the sector and by strengthening sector resource centres in the South.

As a gateway to quality information, the IRC maintains a Documentation Unit and a web site with a weekly news service, and produces publications in English, French, Spanish and Portuguese both in print and electronically. It also offers training and experience-based learning activities, advisory and evaluation services, applied research and learning projects in Asia, Africa and Latin America; and conducts advocacy activities for the sector as a whole. Topics include community management, gender and equity, institutional development, integrated water resources management, school sanitation, and hygiene promotion.

IRC staff work as facilitators in helping people make their own decisions; are equal partners with sector professionals from the South; stimulate dialogue among all parties to create trust and promote change; and create a learning environment to develop better alternatives.

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