ACHIEVING FINANCIAL SUSTAINABILITY AND RECOVERING COSTS IN BANK FINANCED WATER SUPPLY AND SANITATION AND IRRIGATION PROJECTS

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**ACRONYMS AND ABBREVIATIONS**

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<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AAA</td>
<td>Analytical Advisory Activities</td>
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<td>AIC</td>
<td>Average Incremental Cost</td>
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<td>AWWA</td>
<td>American Water Works Association</td>
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<td>BBL</td>
<td>Brown Bag Lunch</td>
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<td>BP</td>
<td>Bank Procedure</td>
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<td>CAPEX</td>
<td>Capital Expenditure Program</td>
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<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<td>FIRR</td>
<td>Financial Internal Rate of Return</td>
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<td>IBNET</td>
<td>International Benchmarking Network</td>
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<td>IBT</td>
<td>Increasing Block Tariff</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>IEG</td>
<td>Independent Evaluation Group</td>
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<td>IFI</td>
<td>International Financing Institution</td>
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<td>ISC</td>
<td>Irrigation Service Charge</td>
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<td>IWA</td>
<td>International Water Association</td>
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<td>LRMC</td>
<td>Long Run Marginal Cost</td>
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<td>MDG</td>
<td>Millennium Development Goal</td>
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<td>NPV</td>
<td>Net Present Value</td>
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<td>NRW</td>
<td>Non-Revenue Water</td>
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<td>OECD</td>
<td>Organization for Economic and Cooperation Development</td>
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<td>OED</td>
<td>Operations Evaluation Department</td>
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<td>OMS</td>
<td>Operational Manual Statement</td>
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<td>O&amp;M</td>
<td>Operation and Maintenance</td>
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<td>OP</td>
<td>Operational Policy</td>
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<td>OPEX</td>
<td>Operating Expense</td>
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<td>OPN</td>
<td>Operational Policy Note</td>
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<td>ORAF</td>
<td>Operational Risks Assessment Framework</td>
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<td>PAD</td>
<td>Project Appraisal Document</td>
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<td>PDO</td>
<td>Project Development Objective</td>
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<td>PforR</td>
<td>Program for Results</td>
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<td>PICR</td>
<td>Project Implementation and Completion Results</td>
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<td>PPP</td>
<td>Public-Private Partnership</td>
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<td>QER</td>
<td>Quality Enhancement Review</td>
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<tr>
<td>RF</td>
<td>Results Framework</td>
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<td>SRMC</td>
<td>Short Run Marginal Cost</td>
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<td>TA</td>
<td>Technical Assistance</td>
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TTL  Task Team Leader
VAT  Value Added Tax
VDT  Volume Differentiated Tariff
INTRODUCTION

Financial Sustainability and Cost Recovery in Water Projects: What is the Problem?

In its 2010 Evaluation of World Bank support to the Water Sector during the 1997 to 2007 period, the Independent Evaluation Group (IEG) highlighted the progress achieved and pointed out issues that still need to be addressed more systematically. The Evaluation noted that: “although the portfolio [of water projects] has performed well when measured against projects’ stated objectives, the Bank and the borrowing countries have not yet sufficiently tackled several tough but vital issues, among them broadening access to sanitation, fighting pollution, restoring degraded aquatic environments, monitoring and data collection and cost recovery”. With regards to the latter point, the Evaluation recommended to:

- Clarify how to cover the cost of water service delivery in the absence of full cost recovery [from users]; and to the extent that borrowers must cover the cost of water out of general revenue, share the lessons of international experience on how to allocate costs most efficiently; and
- Identify ways to more carefully use fees and tariffs to reduce consumption.

The issue of financial sustainability of water projects and water service providers is obviously not new. In its 2003 Review of the Bank’s assistance to water supply and sanitation (WSS) the Operations Evaluation Department (OED), IEG’s predecessor, mentioned an inconstant application of the Bank long standing pricing policies – reiterated in the Water Resources Management Policy, OP 4.07 – and its three objectives of economic efficiency, financial cost recovery and targeted subsidies to the poor. This Review also mentioned that:

- WSS operators often lack the capacity and incentives to apply pricing policies;
- Pricing policies are often inconsistent and have failed to serve the poor well; and
- If there is a general consensus regarding what needs to be done – universal metering, charging tariffs that reflect future costs in accordance to economic principles, subsidizing connections to the poor and targeting consumption subsidies to the poor – these steps have been applied erratically.

The Political Economy of Financial Sustainability and Cost Recovery in Water Projects

Indeed concerns expressed in the 1970s and 1980s with regards to financial sustainability of water projects can in many cases be repeated almost verbatim today:


Achieving Financial Sustainability and Recovering Costs in Bank Financed Water Supply and Sanitation and Irrigation Projects

- Low tariffs; inadequate funds for operating agencies; declining levels of service; unwillingness to pay for poor service; collapse of infrastructure; investment in "rehabilitation"; and
- So the cycle begins again with an initial target of recovering "at least" operation and maintenance (O&M) costs, together with references to inefficient operating agencies, lack of connection between revenues and expenditures, lack of involvement of beneficiaries, and lack of incentives for efficient service provision or productive resource use.

In contrast, the policies and analysis that applied 30 years ago to other key aspects of Bank operations, such as environmental impacts, involuntary resettlement or gender concerns would be unrecognizable today because the Bank had to update its policies and procedures in response to valid concerns expressed by various categories of stakeholders. But for financial sustainability of water projects – and especially cost recovery from users – the issues and the state of play has often remained stubbornly unchanged. Setting water tariffs is obviously a politically sensitive issue that many governments find difficult, but applying strict procedures for protecting the environment or households negatively affected by a project are equally demanding, yet by now are commonplace. If Borrowers have agreed to comply with these more recently updated Bank safeguard principles, they have enjoyed tolerance and flexibility with longstanding Bank guidelines on financial sustainability of projects, and in particular of water projects. The pressure exercised by stakeholders to achieve financial sustainability of water projects has been minimal, and the periodic reviews and evaluations of the performance of water projects by OED and IEG have been insufficient to help move the agenda forward.

Water Supply and Sanitation vs. Irrigation: Common Features and Differences

This Note is a partial response to the above mentioned 2010 IEG Evaluation. It covers the specific issues to be addressed in the WSS sector and in the irrigation sector in two distinct parts, because if WSS and Irrigation have some common features, there are many distinctions to be made.

Among the various water-using sectors, that include navigation, fisheries, hydropower, rain fed agriculture, irrigated agriculture, WSS, and more generally "the environment", cost recovery issues are of primary concern, and are the focus for this Note, in the WSS and irrigation sectors. Here, though, the primary focus is on WSS and irrigation, and though the sectors increasingly

3And by no means new... in colonial times income generation and profitability were central concerns in irrigation investments by the British in Sudan, Egypt, India and Sri Lanka, and questions of who was to finance the infrastructure (local revenue, the Crown, or private interests), whether and how a water fee should be levied, what its impact on different categories of people would be, whether it could influence crop choice or water use behavior, to cite a few examples, were fiercely debated.
4 In passing it should be noted that there are potential financial linkages to other sectors: payment for environmental services provides compensation to users in one location for reducing abstractions and thus releasing water for environmental purposes; in South Africa, all "runoff reducing activities" are treated as chargeable, so that commercial foresters are expected to pay for the incremental evapotranspiration resulting from their activities; and more directly, in the case of multi-purpose facilities (irrigation, hydropower and flood control), the potential sources of revenue are also multi-sectoral.
compete to use the same resource, whether from storage, river abstractions or aquifers, they are strikingly different in many respects that can be broadly classified as physical, financial, economic, political and legal.

Physical. Irrigation is a consumptive user of water: the purpose of irrigation is to bridge the gap between crop water requirements and precipitation, and the water that is provided for this purpose is converted by the plant from liquid to vapor by the process of evapotranspiration. The water thus converted will re-enter the hydrologic cycle of precipitation and runoff at some point in time and space, but it is no longer available for local use elsewhere in the basin. WSS by contrast involves very little consumptive use: domestically, water is primarily used for washing, cleaning, and flushing, returning almost entirely to the system via the sewerage network, when it exists. Industrial use is similarly non-consumptive. After treatment, these return flows are available for reuse downstream.\(^5\) The fact that WSS is a non-consumptive user of water points to the second major difference with the irrigation sector: collecting and treating return flows is in volume terms of equal importance to water delivery. Operationally, the control of water delivery in WSS projects is typically tighter and closer to the consumer than in irrigation projects, and thus metering is quite common. It is very hard to enforce exclusion from irrigation, whether using surface water or groundwater to any potential users.

Financial. WSS is a relatively low volume, high value service, whereas irrigation is a high volume, low value service. As exposed in Section 2 of this Note, WSS charges are typically measured in dollars. As discussed in Section 3, irrigation charges are more often measured in cents, and sometimes in fractions of cents. Dealing with return flows in cost terms is the dominant activity in WSS.\(^6\) Irrigation projects, by contrast, experience return flows of 10-20% of deliveries, and treatment before discharge to rivers is rare.

Economic. WSS charges have limited bearing on economic issues: charges for WSS in one location are essentially irrelevant to charges elsewhere because urban water supply is a non-traded good. Irrigation services, on the other hand, are interdependent via trade in commodities – thus the massive subsidies to agriculture in OECD countries distort prices, and reinforce the demands of farmers in developing countries for subsidies for water, energy and other inputs in order to compete “fairly” in world markets.

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5 Assessing water use in terms of consumption and return flows, and which return flows are reusable provides essential insights into the impact of project interventions in any sector on water scarcity and competition. Too often simplistic terms such as “efficiency” do not translate across sectors and cause confusion. An example from the power sector illustrates the point: there are two ways to cool thermal generators. Either water is abstracted, passed through the cooling system and returned to the source, or the cooling system is “closed” and the water is recirculated and “topped up” to compensate for evaporation. The abstraction in the closed loop case is typically just a few percent of the abstraction in the pass-through system, but consumption in the closed loop technology is 3-4 times higher because it operates at higher temperatures. Clearly, neither is “more efficient” in any generalizable way, but each has advantages depending upon circumstances, and the advantages can only be assessed in neutral terminology of abstraction, return flows, and consumption.

6 In the UK, the charge for water delivered to the household is about US$1.0/m\(^3\), while the cost of sewerage, which is assumed to be 95% of the volume delivered, is US$3.0/m\(^3\).
Political. The constituencies served by WSS programs and irrigation projects are often rather different. Both will resist changes that increase charges, but in the WSS sector the evidence seems to be that an effective piped service, whether public or private, is often cheaper than the ad hoc arrangements with water vendors that many urban households rely on. Also the potential to engage in a rational debate with more educated urban consumers is quite high. Agriculture and irrigation by contrast are substantial employers of rural labor, and form a large element of the democratic process. Farmers argue that water comes free from the sky, and governments should not charge for it. But more generally (and strengthened by the economic issues noted above) the political resistance to irrigation charges is likely to be higher than to WSS charges.

Legal. Countries and their provinces and states may have guidance about how WSS charges should be formulated, but it is rare that a specific project in a specific city will not be able to define appropriate charges more or less independently. By contrast, irrigation charges are frequently defined by statute or law over large administrative areas. For specific irrigation projects, this poses a serious difficulty as it may be impossible to reform charges without reference to the wider administrative context.

In sum, the issues that must be addressed in assuring that funding is available for O&M are common to both WSS and irrigation – but the sectors do have quite different characteristics which will affect the approach that can be adopted.

The Audience of this Note

World Bank staff preparing, appraising and supervising water projects and managers and peers involved in the control of the quality of the documentation prepared by appraisal and supervision teams are the intended audience of this Note.

The Content of this Note

A more general Guidance Note on “financial sustainability of water projects and recovery of costs of water operations from users and tax payers” will be prepared later. This preliminary background Note is divided in four parts:

- A “history” of the call for financial sustainability and cost recovery and the parallel documenting of the lack of progress. This section ends with what this Note hopes to achieve in the face of what is clearly a deeply rooted problem;
- An outline of options to be considered for achieving financial sustainability of WSS service providers and recovering the costs of the WSS service through tariffs, i.e., from users and through subsidies, i.e., from tax payers. This part describes the hallmarks of proper analysis of financial sustainability and cost recovery issues in project appraisal documents.

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7 Islam has specific guidance on this topic; in Egypt, for example, charges are for the service of delivering water, not for the water itself.
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(PAD) and introduces the concept of moving WSS service providers up the ladder of financial sustainability;

- A discussion on what makes financial sustainability of irrigation projects different from WSS projects, followed by practical advice on how to define costs to be recovered, set tariff under different objectives and emphasize the clarity of the (likely) government subsidies; and
- A summary of recommendations to teams involved in the identification, preparation, appraisal and supervision of water projects and of practical measures and actions that both the Water Sector Board and the Water Anchor could take to help improve the Bank’s track record in achieving and financial sustainability of the water projects it finances.

Box 1. Financial Sustainability and Cost Recovery in Water Projects: Definitions

Financial sustainability of WSS service providers and irrigation projects specifically refers to the adequacy of revenues for meeting O&M costs and capital costs. O&M costs can be financed through:

- Charges for water and related services (operating revenues); or
- Government subsidies (non-operating revenues).

Capital costs can be financed from:

- Cash surpluses generated from operations; and
- Long-term debt and/or development grants.

There are almost no examples in developing countries of WSS and irrigation operations whose operating revenues are significantly below O&M costs and that are nevertheless able to develop and maintain their infrastructure and provide a reliable and efficient service to customers. This is because the financial sustainability of WSS service providers and irrigation projects depends greatly upon the predictability and stability of the revenues. In developing countries, the most predictable and stable source of revenue is likely to be the customers, provided however that they have access to the infrastructure and a service of acceptable quality. Government budgets, subject to many restrictions and external “donor” programs, subject to an even wider range of constraints, cannot be considered predictable and stable sources of financing.

Cost recovery specifically refers to the capacity of WSS service providers and irrigation projects to generate operating revenues to customers for meeting O&M costs and capital costs.

A Summary of the Main Recommendations of this Note

Recommendations for Task Team Leaders:

- Define and quantify the expenditures required in the medium term to ensure financial sustainability of the project or the service provider;
- Define the responsibility for meeting such costs between the beneficiaries/users and the
Achieving Financial Sustainability and Recovering Costs in Bank Financed Water Supply and
Sanitation and Irrigation Projects

government/taxpayers, and document how this division of responsibility will evolve over the life
of the project;

- Include in the Project Development Objectives (PDO) appropriate (one or two) financial
  performance objectives;
- Ensure that the Results Framework (RF) clearly defines “financial sustainability” and “cost
  recovery” and includes corresponding monitoring indicators;
- Ensure that Financial Covenants of the Legal Agreement clearly reflect what has been agreed
  with the Borrower in the RF, including the promised provision of government subsidies;
- For WSS projects, locate the service provider on the Financial Sustainability Ladder and design
  the project accordingly;
- Ensure that the Economic and Financial Analyses are complete and include past and forecast
  of income statements, cash flow statements and balance sheets of revenue-earning service
  providers and a cash flow analysis of nonrevenue-earning projects; and
- Include a Financial Sustainability Annex to the Quality Enhancement Review (QER) Package
  that confirms that the above has been complied with.

Recommendations for the Water Sector Board:

- Ensure that the Sector better rewards, recognizes and supports financial analysts and
  economists;
- Commission key analytical advisory activities (AAA) in this area, and especially identify
  innovations and leverage technology;
- Work with the Legal Department (LEG) on the updating of a set of standard financial covenants
  and remedies that are more practical and pragmatic than what is currently available;
- Sharpen core WSS indicators and include at least one indicator that refers to financial
  sustainability and cost recovery from users; and
- Issue a formal Guidance Note on the design on WSS tariffs and subsidies and organize a
  structured training on the topic for headquarters and field based staff.

Recommendations for the Water Anchor:

- Help ensure consistency and thoroughness through mandatory written reviews of most projects
  under preparation (see Annex 6 for a draft review checklist);
- Work with strategic partners to enhance the Bank’s capacity in areas where it has not
  traditionally had a comparative advantage (such as marketing of cost recovery policies to
  stakeholders);
- Report regularly on the progress in achieving financial sustainability for a rolling sample of
  projects (say 15) as they are implemented; and
- Review the Bank’s financial sustainability strategies once every five years through a paper such
  as this one.

Recommendations on Dissemination: Given the wide dispersion of Bank staff, it is further
recommended that this Note be:

- Placed on the Water Sector’s website and introduced through a Bank blog;
- Presented to the Water Sector Board, where staff often connect through Adobe Connect;
- Made into a webinar;
- The basis for a Bank-wide, and if requested regional Unit, brown bag lunch (BBL) presentation;
Achieving Financial Sustainability and Recovering Costs in Bank Financed Water Supply and Sanitation and Irrigation Projects

- Used to help design modules for the Water Orientation Course and formal water sector training courses; and
- An input to the Project “check list” for peer reviewers (Annex 6).

It is also recommended that this report be a background paper for a formal Guidance Note to be issued for Bank staff on financial sustainability and cost recovery in the water sector.
PART 1: THIRTY YEARS OF EFFORT (AND FRUSTRATION)

1.1. Introduction

Much has been written by the World Bank and others on the topic of financial sustainability and cost recovery in general, and financial sustainability and cost recovery for water sector projects in particular. These writings, especially those expressing Bank policy with some degree of formality, represent the guidance that staff have in formulating project and program design, and associated conditionality. The issue has attracted long term concern because it is serious and problematic – project performance varies, but investments that are not maintained always perform below potential.

So what is special about financial sustainability and cost recovery? There is surely little left to “discover”. Many of the policy writings of the Bank and others are erudite, persuasive, based on thoroughly elaborated concepts and extensive evidence from academia, modeling studies, and the field. The challenge is not to find missing links and new approaches, but rather to operationalize what is known, through policy guidance that is practicable, unambiguous, and stable. As the history below demonstrates, the most fundamental issue, namely that funding (as distinct from cost recovery) must be adequate to ensure sustained service delivery, has been diluted if not obscured by more (theoretically) interesting topics such as the structure of incentives, demand management, who should pay what share, and impacts on special groups.

1.2 A Brief History

The following is a brief overview of the history and literature on the topic, including particularly the major Bank contributions.

OPN 2.10 of June 1980. Thirty years ago, Bank Policy on cost recovery in irrigation projects was founded on principles of “economic efficiency, income distribution, and public savings”.8 Efficiency pricing of the resource was seen as an ultimate goal, but with the caveat that “a benefit tax, such as a land-improvement tax” might be necessary where efficiency pricing is not possible. The Operational Policy Note (OPN) 2.10 of June 1980 concludes by noting that “there is no prima facie reason why any particular share of costs... should normally be recovered”. If most beneficiaries are poor, “then cost recovery may well be close to zero”, and that “it may be desirable to include a grace period in the early years of the project.”

Four years later, in 1984, a Vice-President’s Policy Note reported “growing concern over the efforts to recover the costs of investment and of operations and maintenance” because “government efforts to raise resources have been typically weak” leading to “inadequate funding for O&M”. Interestingly, a draft of that note proposed that conditionality should require adequate funding for O&M (from whatever source) rather than focusing on cost recovery, but this was edited out of the

8 As set out in OPN 2.10 (June, 1980).
Achieving Financial Sustainability and Recovering Costs in Bank Financed Water Supply and Sanitation and Irrigation Projects

final text. The note concluded that:

“...long-term objectives should include mobilizing finances by capturing rents from the parties who benefit from irrigation. **An important short-term objective of irrigation policy should be to ensure that revenues provided to irrigation authorities are, at least, sufficient to meet the costs of O&M** [emphasis added].”

Beyond the short term need for sustainable financing from any potential source, the longer term objective was to mobilize resources so as to “recover capital costs and thus permit investments to be replicated”. Nevertheless, the possibility that there may be “specified reasons (for example, equity) why governments choose not to do so” was explicitly recognized. During this period, the guidance to staff was clear – users should pay; charges should be progressive (pro-poor in today’s terminology); payment by volume would encourage user efficiency (demand management in today’s terminology); and subsidies might be needed, at least during the initial phases.

At that time, many countries controlled agricultural input and output prices, reducing farm incomes. It was normal in Appraisal Reports to evaluate this implicit tax and assign it to the farmers’ contribution to cost recovery. Less attention, if any, was paid to ensuring that the government made good this contribution as a transfer payment to the operating authorities.

A review of conditionality and cost recovery in 1986 found that cost recovery covenants were fully met in only 15 percent of irrigation projects, and that recovery rates were mostly in the range of 15–45 percent of O&M expenditures. Limited adherence to covenants was ascribed to: (i) the lack of government commitment; (ii) unreliable water supply due to poor O&M of irrigation systems; and (iii) the often heavy burden of direct and indirect taxes already imposed on the farming sector. In the same year, the Asian Development Bank carried out an evaluation of its irrigation projects and came to conclusions similar to those of the World Bank. In most cases, executing agencies had remained in complete or partial default of irrigation service fee covenants.

**WSS Projects and OMS 2.20 of January 1984.** The content of the analysis of the financial aspect of projects, in particular WSS projects, was clarified in Operational Manual Statement (OMS) 2.20 of 1984. Section 2 of this Note gives a summary of the paragraphs of OMS 2.20 that cover financial aspects. OMS 2.20 also describes in great detail the content of the analysis of the economic, technical, institutional, commercial and sociological aspects of the projects.

OMS 2.20 applies to revenue-earning projects, such as WSS utilities that use accrual accounting methods. Interestingly, it specifically mentions (in its paragraph 40) a water supply company that “also provides sewerage services as an example of revenue-earning entity that has more than one significant business activity”. With regards to financial sustainability of revenue-earning projects, OMS 2.20 refers to “creditworthiness and expected profitability, debt service coverage, operating ratio and returns on invested capital or equity”. An OPN in addition suggested that in IDA countries, IDA credits extended to governments should to be on-lent on IBRD terms to WSS utilities to help build their borrowing capacity. With regards to cost recovery from users, OMS 2.20 simply refers to the “appropriateness of pricing policies/tariff levels”. During the 30-year period under review in Section 1 of this Note, the Bank has however never issued a Guidance Note to help staff assess the appropriateness of WSS pricing policies/tariff levels and seldom provided training on this
important topic. Section 2 of this Note identifies the key topics that could be covered in of such a Guidance Note on the pricing of the WSS service.

OMS 2.20 also applies to nonrevenue-earning entities such as government departments that use cash accounting methods, as well as water user associations (although the latter are not specifically mentioned). If OMS 2.20 does not refer to government subsidies directed at revenue-earning entities, that are supposed to recover their O&M and capital costs from user fees, it does so for nonrevenue-earning projects implemented by government units. Appraisal teams are requested to assess the “government’s capability to provide timely and adequate funds to meet its commitments”. The ongoing effort on Public Expenditure Reviews (PER) in WSS aims at providing guidance to help assess such government capability (Section 2.5 and Box 9).

The Emphasis on Demand Management. The International Conference on Water and the Environment in Dublin in 1992 changed the nature of the debate around service charges, recommending that water be treated as an “economic good”. That principle, one of four agreed at the conference, suggested that “full cost pricing” could be a potent instrument for water management, besides being a sound business principle. The precise definition of full cost pricing included some or all of the following components: O&M, prior investment costs, finance charges, provision for future upgrading and rehabilitation, externalities (such as impairment to the environment), the opportunity cost of water in alternative uses, and inter-generational costs.

Economic instruments and the economic value of natural resources found further legitimacy in the Rio de Janeiro Declaration on Environment and Development of the United Nations in 1992 and its Agenda 21 which supported the “implementation of allocation decisions through demand management, pricing mechanisms and regulatory measures”. More generally, the 1990s saw the rise of the concept of demand management – making the best of what is already available – in part perhaps because supply augmentation (often meaning large dams) was out of favor.

The World Bank’s 1993 Water Resources Policy paper picked up the theme wholeheartedly – emphasizing three distinct roles that economic mechanisms would have in the water sector: ensuring financial sustainability, managing demand, and encouraging the reallocation water to more profitable uses. The following quotes from the 1993 Policy paper are instructive. In each case, bold, primary assertions of the contribution that incentives, prices and recognition of opportunity costs would make are immediately followed by a “practical” caveat (italicized below) that substantially contradicts the primary assertion:

- A key component of the reforms to be supported by the Bank will thus be greater reliance on incentives for efficiency and financial discipline. The Bank will highlight the importance of pricing and financial accountability by using estimated opportunity costs as a guide in setting water charges. In practice, immediate adoption of opportunity cost pricing may be politically difficult. Thus, given the low level of current cost recovery and the importance of finances in the sustainability of operations, pricing to ensure financial autonomy will be a good starting point.
- For irrigation, as for domestic and industrial use, prices reflecting opportunity costs are desirable, but cost recovery fees that ensure financial viability of water entities are a more realistic immediate objective. Since such fees are significantly lower than the opportunity cost of water resources, they reduce but do not eliminate the misuse of water...
The Bank will highlight the importance of pricing and financial accountability. In principle, this entails the use of water fees to broadly reflect the opportunity cost of water. However, given the presently low level of cost recovery and the political difficulty involved in the immediate adoption of opportunity cost pricing, a good starting point is pricing to ensure financial autonomy.

Perhaps the apogee of the Bank’s focus on at least irrigation water pricing was the conference in Morocco in June 2002 focusing on the potential contribution (and to some extent the associated challenges) of introducing water pricing. Two books resulted. The first, based directly on the conference papers, had the keywords: Irrigation; Pricing; Allocation; Management; Efficient water use. Notably, “cost recovery” is missing from the list, which only emphasizes the extent to which the practical debate about financial sustainability had become a theoretical debate about the role that pricing might have in demand management, resource allocation, and the efficiency (i.e. productivity) of resource use.

The second book took much longer to publish. Several of its chapters were originally papers presented at the Agadir conference, and took a rather more skeptical view – indeed the first chapter traces the rise and fall of the “pricing” topic, with the revealing title “Water Pricing in Irrigation: the Lifetime of an Idea”. Around the year 2000 the tide was turning: the word “pricing” is absent from the Bonn Conference recommendations for action, issued in December 2001; the 2002 Stockholm Water Week statement does not refer to the use of economic instruments in managing water in the four principles needing “urgent action needed for water security”.

Public-Private Partnerships, Financial Sustainability and Cost Recovery from Users. In parallel to the high level debate of international conferences and their changing moods on financial sustainability and cost recovery from users, a “grass root” initiative took off in the mid-1980s, when the Bank started supporting public-private partnerships (PPP) in WSS through specific operations rather than in application of centrally elaborated policies. The first urban WSS project relying on PPP was approved in 1989 in Guinea, a country that had been mismanaged since independence in 1958, and where the collection from users was sufficient to cover only a small portion of O&M costs. The PPP – a ten-year “aftermarge” contract – was designed not only to improve the reliability and efficiency of the urban water supply service but also to establish its financial sustainability by limiting its reliance on government subsidies and by gradually recovering O&M and capital costs from users. This move towards full cost recovery was supported by a transparent Bank financed subsidy scheme described in Box 5. Also, in the late 1980s, a large WSS “concession” was awarded in Buenos Aires (Argentina) with the objectives of transferring technical, commercial, financial and foreign exchange risks to a private operator responsible for financing extensions of the infrastructure and recovering its costs from user fees.

Many PPP were initiated in the 1990s and the 2000s in Latin America, East Asia, the Middle East and North Africa and Sub-Saharan Africa. The Bank issued two “toolkits” in 1997 and 2006 to

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guide staff involved in the design of PPP including their financial aspect. A comprehensive review of the PPP experience in developing countries concludes that PPP are a viable option in developing countries, despite highly variable outcomes. It must be noted that if PPP have often been associated with large urban WSS operations, there are also several experiences for small rural piped water supply systems (Uganda, Bangladesh, Latin America…) which all aim at improving the performance of commercial operations and recovering costs from user fees.

The same comprehensive review concludes that “expecting private partners to supply private finance was largely the wrong focus” and that “the biggest contribution that private operators can make is improving operational efficiency and service quality. These improvements have a major impact on access to financing, but indirectly. Customers become more willing to pay their bills when services improves and more efficient operation creates more cash flow from operations to invest in expansion, which in turn increases the customer base and revenues. As creditworthiness improves, a utility can more easily access funding and invest in service expansion. An efficient operator will make good use of the funding that is available for investment, regardless of whether the funding comes from public or private sources”.

The 2003 Camdessus Report. The concerns and remedies set out in the Camdessus report in 2003 were closer to earlier Bank positions, with no stress on the demand management/resource allocation role of charges. The report emphasizes the need for a “stable framework of revenue transfers including sufficient fiscal transfers...” to meet central support commitments. In other words, funding had to be adequate to ensure sustainability, it had to be reliable, and the government was likely to be one of the funding sources. The context of these recommendations was the need to encourage private sector involvement in the water sector, but any agency responsible for operating a large set of infrastructure will need secure revenue sources to plan its operations.

In the same year, OECD published a review of experience among its members. An earlier 1998 report documented slow progress in meeting a variety of objectives in water management, despite “many years of effort”. In particular, prices rarely reflected full economic and environmental costs; demand management policies were still little developed; and agricultural water use was still heavily subsidized.

The Camdessus report’s first recommendation was that financial resources must be adequate. While next recommending that charges should “reflect the real marginal costs of water service provision, and thus provide incentives for efficient water use” the report includes a graph of the prices charged for water in various countries. Australia, which is both extremely water short and internationally recognized as at the forefront of good practices has amongst the lowest recorded volumetric charges – a conundrum that was not addressed in the report, but is discussed further.

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11 Toolkits for Private Participation in Water and Sanitation; the World Bank, 1997; and Approaches to Private Participation in Water Services: A Toolkit; the World Bank, 2006.
12 Public-Private Partnerships for Urban Water Utilities: A Review of Experiences in Developing Countries; Philippe Marin, the World Bank, PPIAF; 2009.
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below.

The 2004 Bank Water Resources Sector Strategy. In 2004, the Bank’s new Water Resources Sector Strategy endorsed the 1993 document, but the new theme was principled pragmatism: “Principled because of the importance of economic principles, such as ensuring that users take financial and resource costs into account when using water. And pragmatism because solutions need to be tailored to specific, widely varying natural, cultural, economic and political circumstances.”

The recommended approach in the 2004 Strategy paper emphasized quotas and defined allocations or water rights as means to make farmers implicitly aware of opportunity costs rather than the explicit mechanisms of prices or markets that dominated the 1993 paper. The 2004 paper also raised the contentious issue of tradable water rights – contentious because many see this as commercialization of a natural “god given” resource, with the potential to price poor users out of the market, distort allocations in favor of the rich, favor speculators, and so on.

2004 also saw the publication of reports by FAO and HR Wallingford that came to very similar conclusions regarding cost recovery to those set out in the Bank’s Water Sector Strategy. These reports were based on substantial background studies from the field (analysis of the approach to irrigation service fees in six widely differing countries) and lessons from the literature (a review of the literature on the theory and practice of charging for water). The FAO report summarizes and interprets the evidence and experience, including some material related to WSS. The Guidelines include detailed analysis of the various options in designing service charges, and propose a systematic approach to the process of establishing.

Contributions subsequent to 2004 include the Sourcebook for Investment in Agricultural Water Management (2005), which includes Investment Notes on various topics including “Pricing, Charging and Recovering for Irrigation Services – which largely reiterates the view that quotas and water rights are central to sustainable resource use, while charges should be aimed at financial sustainability. Another investment note in the same volume (Economic Incentives in Agricultural Water Use) is, however, closer to the 1993 position, advocating “efficiency” pricing.

Also in 2005 an Agriculture and Rural Development department report reiterated the theory underlying the potential role of various forms of pricing, though with considerable emphasis on the merits of water rights and the difficulties in implementing complex systems.

Most recently (2010) the Implementation Progress Report on the Water Resources Sector Strategy provides an extensive review of the status of cost recovery and funding of O&M. It states “At the project level, the Bank will continue to focus on cost recovery in water projects. Through a series of projects, the Bank will support the gradual coverage of costs, starting with O&M costs. To ensure

14 Cost Recovery and Water Pricing for Irrigation and Drainage Projects.
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that cost recovery is being addressed in each project, the Bank will conduct a more thorough review of the financial aspects of water projects (including the identification of subsidies and agreement with all stakeholders on how such subsidies will be funded), strictly enforce the projects’ financial covenants related to cost recovery, and pay more attention to financial issues in water projects in general.

The statement that the Bank will support the gradual coverage of costs, starting with O&M costs could have been written in any of the three decades under review here. Even in the 1993 policy paper, where the role of economic instruments was so strongly emphasized, the basic (future) target was recovery of O&M. Hardly progress. But the final points, regarding attention to required subsidies, agreement on how they will be funded and strict enforcement of financial covenants are clear and unambiguous, providing the starting point for this report.

A very similar statement was almost included in the 1984 policy note. If it had been, and had been effective, the implementation problems would have been severe, but it is likely that much of the infrastructure constructed subsequently would now be in better condition, and the services delivered would have been closer to the design specifications. In the event, the more intellectually exciting prospects of optimizing allocation, encouraging more efficient use, complex tariff structures to reflect social concerns, and embodying dimensions such as environmental impacts into the structure of service charges has dominated much of the debate. These are critical issues, but none can be served by collapsed infrastructure, and in reality institutions need adequate and predictable resources to provide services to irrigators.

Pragmatism and Flexibility in WSS Operations. Pricing of the WSS service has been less written about than water resource management and irrigation, although it is almost often implicitly covered in the various documents mentioned above. The performance of urban and rural WSS projects has been variable. Some urban WSS service providers to whom the Bank has lent or extended credits do generate operating revenues sufficient to fund O&M costs, depreciate fixed assets, cover financing costs and contribute significantly to their capital expenditure programs (CAPEX). Some rural WSS projects generate revenues to cover O&M costs and have succeeded in convincing the communities to finance the renewal of the pumping equipment. But many urban and rural WSS projects supported by the Bank still struggle with the simple recovery of their O&M costs from user fees and still rely on unpredictable government operating subsidies to survive and/or even less predictable external donors financing to develop their infrastructure.

As mentioned at the beginning of this Section, both Borrowers and Bank staff have enjoyed a degree of flexibility with regards to financial sustainability of WSS projects that is not allowed for other aspects of project design and implementation such as environmental and social safeguards. In the absence of strict enforcement procedures of guidelines, the analysis of financial sustainability and cost recovery in WSS projects varies greatly in Bank documentation. Annex 4 reviews how these issues are covered in 12 urban and four rural WSS projects approved since the beginning of 2010. There is obviously a quality control issue when Project Appraisal Documents (PAD) do not:

- List financial sustainability and cost recovery as Project Development Objectives (PDO);
- Clarify how financial sustainability and cost recovery from users are to be monitored in the Results Framework (RF);
Propose financial covenants that are not consistent with the RF and not tailored to the issues to be addressed;
Discuss the various factors that may affect financial sustainability, beyond delays in tariff adjustments in Operational Risk Assessment Frameworks (ORAF); and
Fail to include a financial analysis meeting the requirements of OMS 2.20 that clearly discusses whom the Bank is lending to in addition to what the Bank is lending for.

There is also a quality control issue when Supervision documentation fail to monitor progress achieved on the above and in particular do not comment on financial statements of revenue-earning WSS service providers and do not raise “red flags” when the financial situation steadily deteriorates.

**Box 2 "Must Read"**

Much has been written on financial cost recovery in the water sector. Below is a list of a few publications/papers that are considered by the authors as the “must reads”:

**Water Supply and Sanitation**

OMS 2.20 (of course!)
Principles of Water Rates, Fees and Charges; Manual M1 of the American Water Works Association AWWA (a 400-page manual that covers all aspects of WSS tariff setting; so be selective in your reading)
The two Bank papers on economic regulation: "Economic Regulation of Urban WSS Services: Some Practical Lessons" by D. Ehrhardt, and “Explanatory Notes on Key Topics in the Regulation of WSS Services" by Eric Groom
"Who Benefits from Utility Subsidies"; by Kristin Komives

**Irrigation**


**1.3. Going Forward**

After some 30 years there is not much progress to report for either WSS or irrigation projects and the already mentioned 2010 IEG evaluation cited the Bank’s “limited success with full cost recovery”.

While the current Note certainly cannot solve all the challenges the Bank faces in achieving financial sustainability and cost recovery in the water sector, it does endeavor to accomplish the following:

- Acquaint Bank staff with the context and duration of the challenge;
- Broadly describe the theories of cost recovery in an easily accessible way;
- Provide practical approaches to cost recovery in project design; and
- Suggest an enhanced role and practical actions for both the Water Sector Board and the Water Anchor.

The Note makes only passing remarks on the important topic of the political economy of financial sustainability and to the key variable of the equation – cost recovery from users (see above). The Water Anchor is publishing in FY12 a Note entitled: “Governance and Political Economy in the Urban Water Sector”. Readers are encouraged to consult that paper in conjunction with this Note.

Another further consideration going forward deals with dissemination. It is recommended in Part 4 to translate the findings of this Note into a formal Guidance Note. The ability to make this Note available to the World Bank’s widely dispersed water sector staff will also require technology and the internet – principally through webinars. Finally, this Note could serve as the basis for a learning module in a more formal training program for Bank staff.
PART 2: FINANCIAL SUSTAINABILITY AND COST RECOVERY IN WATER SUPPLY AND SANITATION

2.1 Recovering Costs from Users and from Tax Payers

Governments typically aim at providing a universal, reliable, efficient, financially and environmentally sustainable and affordable water supply and sanitation (WSS) service to urban centers and rural communities. Because drinking water and wastewater have at the same time the characteristics of a “private good” and of a “public good”, it makes sense to consider contributions from both users, through tariffs and other user fees, and tax payers, through subsidies targeted at service providers or consumers, for recovering the costs associated with the achievement of these objectives.

**Drinking Water.** Drinking water supplied by piped systems has the characteristics of a private good: consumers can be charged for the quantity used and non-payers can be excluded from the service. Private goods are better provided by businesses, whether publicly or privately owned, that recover their costs from user fees. But because public health depends partly upon the quality of the water consumed, piped water also has the characteristics of a public good. Households which may not understand the benefits of drinking safe piped water or do not have the revenues to pay for it should be encouraged to use a minimum quantity of it through targeted subsidies. Drinking water supplied by community point sources also has these two characteristics.

**Wastewater and Sanitation.** Wastewater and basic sanitation also have both the characteristics of a private and public good. Producers of wastewater, i.e., water consumers, are usually willing to pay for its collection and transportation at distances that do not affect their immediate environment. Also, households are usually willing to pay for the minimum comfort and privacy offered by on-site sanitation installations. But they are much less concerned with the safe disposal of wastewater and/or excreta in water bodies. Because public health and the quality of the environment depends upon the latter, wastewater and basic sanitation also have the characteristic of a public good that justifies government actions and financing.

After clarifying the types of WSS service and WSS service providers that are covered in this Note, Part 2 includes four main sections:

- Section 2.3 discusses options for recovering the financial costs of WSS service providers from tariffs and user fees. It also reminds the content of the Operational Manual Statement (OMS 2.20) on the financial appraisal of projects and discusses the objectives of financial covenants attached to Financing Agreements.
- Section 2.4 clarifies that WSS tariffs have to be set for meeting, beyond recovering financial costs, objectives such as: (i) promoting good operational and capital development practices (efficiency objective); (ii) managing demand (economic objective); and (iii) avoiding discrimination among users and ensure access to a minimum consumption of water by low income households (equity objective). As part of this discussion, the Note rapidly reminds the objectives of economic regulation.
• Section 2.5 presents options for assisting WSS service providers meeting their costs through fiscal transfers.
• Section 2.6 suggests practical improvements to the key elements of project appraisal documents (PAD) that are the Project Development Objectives (PDO), Results Framework (RF), Operational Risks Assessment Framework (ORAF) and the economic and financial analysis to ensure that financial sustainability and cost recovery issues are adequately covered.

2.2. Water Supply and Sanitation Service and Service Providers

Piped vs. Individual Point and On-site Services. This Note mostly discusses the recovery of costs associated with the piped water service provided in urban and in rural areas and the piped wastewater collection and treatment service provided in urban areas. Piped WSS services are mostly characterized by the need for managing large numbers of customer accounts and are usually natural monopolies. The Note discusses more rapidly the recovery of costs associated with the service provided by point water supplies in rural settlements and peri-urban areas. It does not discuss the recovery of costs associated with individual point water supplies and public and individual on-site sanitation facilities.

Water Supply and Sanitation Service Providers. This Note applies to several types of WSS service providers.

• In urban areas, WSS service providers are usually autonomous companies owned by central, provincial or local government(s) that are managed as public corporations using accrual accounting methods and whose financial statements can be independently audited. This form of WSS service provider, referred to as “utility” in the Note, represents the largest number of beneficiaries of Bank-financed urban WSS projects. The mandate of such utilities can cover water production only; water distribution only; combined water production and distribution, wastewater collection and treatment only, or combined water supply and sanitation. In some cases the sanitation mandate of the utility is extended to the collection and treatment of sludge generated by individual sanitation facilities (septic tanks) and even the operation and maintenance (O&M) of storm water drainage systems.
• In urban and rural areas, the piped WSS service is sometimes provided by government departments, run as such and using cash accounting methods. If many Bank-financed rural WSS projects are implemented by government departments, this is seldom the case for dedicated urban WSS projects. However municipal or local government development projects, implemented by such departments, may include large WSS components. The recommendations of this Note apply to WSS components of this type of project as well. In rural and peri-urban areas, small piped water systems and point water systems, such as wells and boreholes fitted with handpumps, are usually operated by communities or water user associations that use simple cash accounting procedures.
2.3 Setting Tariffs for recovering Financial Costs

Estimating Revenues Needed. Basically a WSS service provider, whether a utility or a simple water user association, has to recover its O&M costs and the costs associated with the development of its infrastructure. A Bank Note on “Financing WSS Investments – Estimating Revenue Requirements and Financial Sustainability” summarizes the two main approaches used for estimating revenues needed for recovering such costs. The two methods could result in somewhat different user fees, as discussed in Annex 1.

- Revenues generated have to be sufficient for covering the WSS service provider’s “cash needs”, i.e., its O&M costs and the repayment of the principal and interest on its loans. Revenues are thus directly affected by the capital structure of the WSS service provider: if all investments are financed by grants, cash needs are limited to O&M costs. This method of estimating revenues, based on cash accounting, is mostly consistent with the vision of service providers using cash-based budgets, such as government departments or water user associations.

- Revenues generated have to be sufficient for meeting “utility costs”, i.e., its O&M costs, the depreciation of its fixed assets and a return on assets sufficient to service the debt and remunerate the equity invested. In this case, revenues are not directly affected by the capital structure and translate the principle that investments have to be recuperated with a profit to cover the cost of financing, whether debt or equity. This method of estimating revenues, based on accrual accounting, is consistent with the vision of utilities managed as corporate entities, whether public or private owned.

Cash Needs in Practice. Since cash costs are covered, the cash needs approach can be considered financially sustainable in the short-term. But it perpetuates the WSS operation’s dependency on debt and, if applicable on development grants, as it does not allow building up cash reserves to protect the WSS operation against external shocks (Box 3). Also, it translates in the need for steep tariff increases each time a lumpy investment is to be financed. One way of addressing the former issue is to limit the share of debt financing and to request the WSS operation to contribute to the financing of its capital expenditure program (CAPEX) from cash surpluses. Several Bank financings have included a cash contribution to the CAPEX as the main financial covenant. Annex 2 is a copy of the financial covenant of the Loan Agreement for improving the WSS service in the Jakarta (Indonesia) approved in 1990.

15 Financing WSS Investments – Estimating Revenue Requirements and Financial Sustainability; A. Baietti and P. Curiel, WSS WSS Working Note no 7, the World Bank, 2005

16 If this approach is well adapted to a utility that uses cash surpluses for financing its ongoing CAPEX, it is more difficult to implement by a water user association for financing the replacement of pumping equipment every 10 or 15 years, as setting aside annual provisions for renewal is not practical. In most cases user associations raise the financing for replacing the equipment directly from their members when needed.
 Until the mid-1980s the rapid expansion of the WSS sector of Côte d'Ivoire under the responsibility of a Department of the Central Government was financed exclusively on debt. The water tariff was reset every four years for meeting future O&M costs, i.e., the costs of the contract with the private operator SODECI, and repaying sectoral loans. The National Water Fund, responsible for servicing the debt, was replenished by the difference between the tariff paid by the customers and the tariff SODECI was allowed to retain on its collection from customers to cover the costs of its contract. When: (i) the exchange rate of the US dollar, in which a large share of the debt was denominated, steeply appreciated against the local currency, and (ii) a slowdown of the economy resulted in lower sales to large industrial customers whose water bills were the main contributors to the National Water Fund, the latter was insufficiently replenished and unable to service the debt. The WSS sector was hit by a major financial crisis despite having been operated by an efficient and profitable private operator since the late 1950s.

The financial recovery program, supported by a Bank financed Water and Sanitation Adjustment Loan (WASAL), was in particular based on: (i) a rescheduling of the sectoral debt still to be serviced by the National Water Fund; (ii) a reallocation of sector responsibilities, with SODECI becoming responsible for identifying and implementing the capital development program; and (iii) revised sector financing policies, with future capital spending being strictly limited to what could be financed from cash surpluses generated by operations. Despite this latter restriction, between 1988 and 2006 SODECI was able to increase the number of residential connections from 200,000 to 550,000, in particular by focusing the capital development program on extensions of distribution networks and by subsidizing the cost of new connections provided to low-income households.


**Utility Costs in Practice.** The utility costs approach helps building up cash reserves, limiting reliance on debt and protecting the WSS service provider against external shocks. A few Bank WSS projects have included a return on fixed assets in operation covenant in their financing agreements. Annex 3 gives a copy of the financial covenants of the Project Agreement for a sewerage project system in Busan (Korea) approved in 1992. However, in order to be meaningful, this covenant requires that fixed assets are adequately valued. When this is not the case, they may have to be revalued; if fiscal regulations do not allow it, the revaluation would have to be carried on a pro forma basis. This is partly why such type of covenant is seldom used. Also, depending upon the rate of return sought, this method may lead to an accumulation of a large cash reserve giving the impression that the WSS operation is making too much profit. The risk of the cash being diverted for purposes other than WSS is high in particular for public WSS Utilities. Another potential issue with this approach is the discrepancy between the average depreciation periods of WSS fixed assets, of typically 25 to 40 years, and the maturity of the debt available in most developing countries for financing infrastructure projects: depreciation of fixed assets may not be sufficient for repaying the loan principals and thus meeting cash needs. The already mentioned
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Note on “Estimating Revenue Requirements” suggests a “hybrid” approach whereby revenues are estimated to be sufficient to cover O&M costs, the debt service (principal and interest), the depreciation of equity financed assets and a return on equity, allowing cash needs to be met and cash reserves to be built (Annex 1).

**The Cost of Poor Collection.** Income statements of a WSS utility report billing, not collection, as operating income. There are two types of unpaid bills a utility typically has to deal with:

- Those that would never be recovered, no matter what, and for which a “provision for bad debt” has to be listed as an operating expense. In WSS operations where private and public customers are used to pay their WSS bills, even with some delay, the provision for bad debt can probably be limited to one to three percent. In WSS operations, where certain categories of customers are known to be recurrent defaulters, such as government agencies in most African countries, it may have to be much higher.
- Those that would be recovered with some delays and for which the utility has to provide additional working capital for keeping its cash position positive. Working capital variations are reported in cash flow statements, not in income statements.

For estimating revenues required for meeting cash needs it is thus be prudent to add to the utility’s O&M costs, debt repayment and, if applicable, cash contribution to the CAPEX: (i) a “reasonable” provision for bad debts; and (ii) the need for financing variations of working capital requirement (Box 4).

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**Box 4 Niger – Clear “Cash Needs” Covenant**

The main financial covenant of the Niger Urban Water Supply and Sanitation Project, approved in 2011, requires the national WSS Utility that implements it to restore its “financial equilibrium” by end 2012 and defines the latter as: “the previous year cash flow from operations minus debt service and variation of working capital requirements for the year being positive or equal to zero”.

*Source: AFTUW: PAD of the Niger Urban Water Supply and Sanitation Project (P117365)*

**The Cost of Foreign Exchange Variations.** In the absence of capital markets able to mobilize long-term financing in local currency on terms compatible with a sector that depreciates fixed assets over long period, WSS service providers have to borrow in foreign currencies, most of the time through their governments or with a guarantee of the latter. In many cases, the government on-lends proceeds of its borrowings in local currency and bears the foreign exchange risk by adding a mark-up on the interest rate charged to the WSS Utility. When it is not the case, the utility may have to add a provision for foreign exchange risk variations in its cash needs. Another Bank Note discusses the influence of devaluations of local currencies on cash flows of WSS utilities, and concludes that the foreign exchange risk is the most difficult one to mitigate in the WSS sector. If

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A "creeping" devaluation of a few percentage points per year can reasonably be taken care of by an automatically triggered cost index formula, a "catastrophic" devaluation such as that that hit East Asian countries in the late 1990s, or Argentina in the early 2000s is simply unbearable. "Shock" devaluations, i.e., devaluation of five to 10 percent per year with the likelihood that the local currency could recover in the medium-term, are according to this Note, well suited for risk mitigation instruments offered by International Financing Institutions (IFIs).

2.3b Appraising Water Supply and Sanitation Operations

Operational Manual Statement 2.20. For meeting financial objectives, revenues have to be estimated in reference to a financial forecast of the WSS operation. The Operational Manual describes in great detail the content of financial appraisals of Bank-financed projects. OMS 2.20 clarifies that "the scope of the financial appraisal varies depending upon whether or not the project is revenue-earning and the extent to which the implementing agencies are financially autonomous" and therefore applies to WSS utilities, as well as government departments or water user associations. OMS 2.20 is reproduced in the five paragraphs below.

What does OMS 2.20 Require?

Revenue-Earning Projects. For a revenue-earning project, an analysis should be made of the amounts, terms and conditions of capital funds required for project implementation and the adequacy of revenues resulting from the project to cover the project's O&M costs, provision for depreciation, and debt service requirements. For this purpose, the appraisal should review the annual financial projections for the project including: (i) project income statements showing revenues and other income and cost of operations, maintenance, depreciation, and interest on borrowed funds; and (ii) project funds statements showing investment, working capital, and debt service requirements and sources of financing including internally generated funds from operations and externally provided loan and equity capital.

In case the project is a large part of the investment package rather than a self-contained investment, appraisal should focus on the soundness of the implementing agency's overall operations, and include a comprehensive analysis of the entity's historical and forecast financial performance, including its existing operations, the project and any other planned investments. The financial analysis should review annual income statements, statements of source and application of funds and balance sheets and estimate creditworthiness and expected profitability, such as debt service coverage, operating ratio and returns on invested capital or equity.

When the project is a minor part of the implementing agency's overall operations, an analysis based on historical financial statements is usually adequate accompanied by separate accounts and forecast for the project and the operations associated with it.

A key element of the Bank's financial appraisal is to assess: (i) the reasonableness of the financial forecasts; (ii) the appropriateness of the pricing policies/tariff levels; and (c) the possibilities of
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reducing costs and improving performance. Judgments should also be made on whether the entity is likely to have sufficient working capital, debt (interest plus amortization) is likely to be covered and whether other commitments such as the financing of non-project investments are likely to be made.

**Nonrevenue-earning Projects.** For nonrevenue-earning projects, forecasts may be limited to annual expenditures during implementation and the first two years of full operation in order to demonstrate the annual investment commitments required by the Borrower, the recurrent financial costs of O&M and any incremental tax receipts resulting from the project.

**Financial Covenants.** Finally OMS 2.20 mentions that in order to protect both the Borrower and the Bank’s accountability and financial standing, appraisal requires an assessment of whether the financial objectives of the project and the enterprise can be achieved. In many cases, this requires agreement with the Borrower on both the financial objectives and the actions necessary to achieve them. Such agreements generally take three forms:

- Agreeing with the Borrower on appropriate financial performance covenants;
- Making the loan conditional on actions such as advance equity contributions, guarantees or other security arrangements; and
- Agreeing on specific performance indicators, such as labor/output ratios, control of unit costs, inventory controls, collection of receivables, and adequate budgeting for maintenance expenditures.

**Complying with OMS 2.20 in Practice**

If OMS 2.20 has not always been complied with in recently approved WSS projects (Annex 4), it is still the main guideline available to Bank staff for financially appraising WSS projects. Quality enhancement review (QER) meetings should normally check that the PAD includes a financial analysis that meets OMS 2.20 requirements.

**Emphasis on Financial Sustainability.** OMS 2.20 emphasizes that assessing the financial sustainability of a WSS utility requires a detailed analysis of its income and cash flow statements and of its balance sheet. It also emphasizes the importance of cash flows for achieving financial sustainability. If billing, reported in the income statement, is adequate but bill collection is low, accounts receivable, reported in the balance sheet, increase and working capital requirements, reported in the cash flow statement, limit the capacity to service the debt and contribute to the CAPEX.\(^{18}\)

**When Collection does not cover Cash Needs.** When current collected revenues are insufficient to cover cash needs, the priority should be on agreeing on a financial recovery plan of the revenue earning entity to which the financing is extended. This plan could combine:

\(^{18}\) The working capital is the difference between short term assets (inventories and accounts receivable) and short term liabilities (accounts payable).
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- Reducing operating costs, in particular staff and energy costs;
- Increasing sales revenues by adjusting tariffs and expanding the customer base;
- Improving collection through targeted incentives;
- Injecting additional equity by shareholders; and/or
- Restructuring the balance sheet by writing off uncollectable arrears and forgiving, freezing or rescheduling existing debt.

Many public-private partnerships (PPP) have attempted to provide an answer, and often succeeded, to the above three bullet points by subcontracting technical and commercial operations to private professional operators. When the quality of the WSS service is still poor, but gradually improving, two difficult political decisions have to be taken when designing a financial recovery plan regarding: (i) the pace of WSS tariff increases; and (ii) the enforcement of bill payment. The “common sense” approach that consists in waiting until the quality of the service has improved to charge cost recovery tariffs and to disconnect customers in arrear usually does not work. Enhancing the quality of the WSS service, such as increasing the number of hours per day during which water is available, always takes many years, and when it is finally felt that customers may be willing to accept to pay cost recovery tariffs, the magnitude of the increase needed often makes it politically impossible to implement.¹⁹ Box 5 describes the case of Guinea (Conakry) where a transparent subsidy scheme was put in place to support regular tariff increases while the quality of service was improving.

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¹⁹ In Yerevan, Armenia, the water supply service was provided only an average seven hours per day until 1998. A Management contract with a professional operator helped increase the average number of hours of service to 18 per day by 2006. Mid-way through the ten-year Lease contract with another professional operator that started in 2006, the performance improved to 21 hours per day; a permanent service is likely to be achieved by 2016. It would have thus taken 18 years to supply water on a “24/7” despite a daily per capita production of about 800 liters.
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In the late 1980s, Guinea embarked on a bold reform of its urban WSS sector based on: (i) the sub-contracting of the technical and commercial operations to the private operator SEEG within the framework of a 10-year aftermage (lease) contract with the public asset holding company SONEG; and (ii) the gradual move towards full recovery of O&M and capital costs from user fees.

The full cost of water, estimated at about GF400/m$^3$ (equivalent to US$0.80/m$^3$) had to be compared with the GF60/m$^3$ customer tariff that was applicable before the mobilization of SONEG and SEEG. The Government agreed to immediately raise the customer tariff to GF150/m$^3$, a level sufficient to cover SEEG’s operating expenses in local currency and make a limited cash contribution to SONEG’s capital budget. The Government also requested funds from the World Bank to finance 100 percent of the foreign exchange component of SEEG’s tariff for four years, and a gradually decreasing share of it for six more years, so that after ten years SEEG’s tariff would be fully covered by collections from customers. This support was to be paid on the basis of the actual amount of collection of water bills by SEEG, so that the latter would obtain the tariff indicated in its bid for each cubic meter of water billed and collected (this is indeed a good example of “output-based” financing). The Government finally agreed to service 100 percent of SONEG’s debt for two years and then to gradually decrease its support so that the debt would become fully serviced by SONEG after six years. This move towards cost recovery was ambitious, but nevertheless implemented, even more rapidly than initially envisaged. After seven years, revenues from customers were sufficient to cover O&M, depreciation and financing costs and to contribute cash to SONEG’s CAPEX.

Source: Reforming Urban Water Utilities in Western and Central Africa: Experiences with PPPs; Case Studies; M. Fall, 2009.

When Tariffs are imposed. Typically, planners identify medium-term development programs to meet coverage objectives, such as that proposed by the Millennium Development Goals (MDG), and later estimate their likely consequences on CAPEX, tariffs to be charged and/or subsidies to be obtained; often to come to the conclusion that neither is affordable. A few WSS service providers have asked the questions in the reverse order by: (i) estimating cash surpluses that could possibly be generated taking into account imposed tariff ceilings, likely future sales and operational efficient
gains; and (ii) identifying the CAPEX and financing conditions that could be implemented. When following this approach, key issues to be considered are:

- **Willingness to charge.** In the absence of a clear pricing policy and a truly independent regulatory arrangement for implementing it, the willingness to charge of elected governments often constitute the hard constraint to be taken into account early in the planning process.
- **Willingness to pay.** Looking at total household WSS budgets, not only at water bills can provide valuable information on the customer willingness to pay, especially when the official piped service is of poor quality and cause customers to rely on substitutes.
- **Elasticity of demand to pricing.** When governments are considering cost recovery tariffs, demand and bill collections are likely to be affected (Section 2.4b below).
- **Likely financing conditions.** As discussed in Section 2.5 below, a mix of development grants and long-term loans and mitigation of the foreign exchange risk may have to be considered for limiting tariff increases.

**The Good Use of Financial Covenants.** If OMS 2.20 clarifies that financial covenants are primarily meant to record agreements reached between the Borrower and the Bank during project appraisal, there seems to be a widespread belief among Bank staff that they do not work because they are perceived as being imposed on the Borrower and are difficult to enforce anyway. OMS 2.20 does not refer to the Results Framework (RF), that was later added to the PAD but in a well-prepared PAD, financial covenants should simply translate in legal terms the financial performance agreed to be achieved in the RF, and further elaborated in the financial analysis. Clear financial covenants would clarify what supervision, often carried out by staff who were not involved in the project design and appraisal, should focus on.

2.4 **Setting Tariffs for achieving Efficiency, Economic and Equity Objectives**

**Designing Tariffs pursues Several Objectives.** Setting WSS tariffs levels and structures is a complex exercise that pursues several objectives that sometimes are in conflict:

- **Financial:** as discussed above, tariffs have to be set to help build the financial sustainability of WSS operations, i.e. their capacity to finance their O&M costs, repay their debt and contribute cash to the investment programs from sales revenues.

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20 This approach has been followed in Senegal since the mid-1990s, a country where the mobilization of the water source for the capital city Dakar is extremely expensive.

21 In Delhi, India, a survey of 10,000 customers concluded that typically customers are spending as much for installing individual pumps, roof tanks and disinfection equipment to simulate a “24/7” service and guarantee the bacteriological quality of the water consumed as on their official water bill.

22 In Côte d’Ivoire in the mid-1980s, a steep increase of the tariff block applying to industrial and commercial customers – that represented only about 20 percent of the customers but almost 80 percent of the revenues – resulted in a decrease of the sector revenues when they decided to reduce their consumption of piped water by recycling it or by developing their own supplies.
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- **Efficiency**: tariffs have to be set to avoid passing on to consumers the costs of inefficient operations and infrastructure development by WSS service providers typically acting as natural monopolies.
- **Economic**: tariffs have to be set to manage demand for water and limit the depletion and pollution of its sources.
- **Equity**: tariffs have to be designed to avoid discrimination of certain categories of customers and ensuring the provision of a minimum service to low-income consumers.

If tariff setting is most often limited to attempting to meet the financial objective, and to a lesser extent meeting efficiency and equity objectives, there are a few examples where tariffs are set for meeting all the above objectives at the same time. Box 6 describes WSS tariff policies in effect in Chile, usually considered best practice.

**Box 6. Chile – a Tariff Setting Mechanism Designed to Achieve Several Objectives**

The economic regulation of the urban WSS service in Chile is often considered best practice. Until the end of the 1980s, the public company that provided the WSS service in the country generated revenues insufficient to cover O&M costs. A series of in-depth reforms have since decentralized the WSS service to regional levels, allowed the privatization of WSS service providers, clarified tariff setting principles and established an effective and independent Regulator. Currently, 18 private “concessions” provide the urban WSS service and finance their development exclusively through cash generated from operations and funds raised on local capital markets without financial assistance from the government. The principles introduced by the 1988 Tariff Law can be summarized as follows:

- **Dynamic efficiency.** The tariff should be set by reference to a model company “efficient” from both the operation and development points of view to encourage efficiency gains.
- **Economic efficiency.** The tariff should be set in reference to the long run marginal cost (LRMC) of water. LRMC calculations should include the cost of externalities, such as the collection and treatment of wastewater. LRMCs are estimated by the Regulator for 320 typical water supply systems and 270 typical waste water systems, by dividing discounted incremental capital and operation expenses by discounted incremental sales.
- **Intelligibility.** The tariff structure should guide producers and consumers in production and consumption decisions: the tariff structure should take into account the various stages of service (water production, water distribution, waste water collection, and waste water treatment and disposal) per system and take into consideration the seasonality of demand.
- **Equity.** The tariff should be non-discriminatory, except when the cost of service varies. All subscribers should pay the same tariff per cubic meter within the boundaries of the same WSS operation. Low income households (who are well identified) should benefit from a discount on their water bills financed by a Central Government program.
- **Self-financing.** If as a result of tariff setting at LRMC, a concession is not self-financed, the Law recognizes the necessity for setting the tariff at a level that would allow the model company to meet its short term financial obligations.
WSS tariffs are reset by the Regulator for a period of five years and are automatically adjusted to take into account inflation between two resetting. In 2005, water coverage was almost 100 percent; sewerage coverage was 95 percent; and close to 75 percent of wastewater was treated before disposal. The average WSS tariff was equivalent to US$1.02/m³, fixed assets were valued at US$3,500 million, the average debt equity ratio of concessions was 0.99 and the average return on equity invested was 18 percent.

Source: Compilation of data available from the website of the Regulator SISS by the authors (2007).

Bank Guidance on Tariff Design. Significant work has been made by policy makers and regulators on tariff setting since the early 1980s.23 If OMS 2.20 clearly defines how tariffs are to set for achieving financial sustainability, the Bank has not during the last 30 years published a Guidance Note on tariff setting for meeting other objectives listed above and has not recently provided comprehensive training on this topic to its headquarters and field staff. Bank staff are however often requested by Borrowers to advise on the design of tariff policies and on their implementation arrangements.

2.4a Setting Tariffs for encouraging Efficiency

Tariff Increases vs. Efficiency Gains. Recovering costs does not systematically require increasing tariffs: it can also be achieved by:

- Reducing operating costs – but not maintenance costs – by, for example, enforcing contractual operating performance objectives; and
- Capital costs by ensuring that least cost solutions are implemented.

Figure 1 below shows how the tariff index, i.e., is the average tariff corrected for inflation divided by the original tariff, and the ratio of collected revenues (sales volumes) to O&M expenses have evolved between 1998 and 2005 in Senegal, a country where the private operator of the water supply service has been encouraged to, at the same time: (i) improve its operating performance to meet contractual obligations; (ii) avoid penalties for non-compliance with the latter; and (iii) maximize its operating profit.

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23 For example, Manual M1 on “Principles of Water Rates, Fees and Charges” of the American Water Works Association (AWWA) provides a very detailed guide to US WSS Service providers illustrated by examples and case studies. Australia, the UK, and many other countries have developed detailed guidelines. The OECD and the EU have also recently launched several initiatives on this topic and strategic planning.
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Figure 1. Senegal – Efficiency Gains achieved through Contractual Obligations

Setting Realistic Objectives. Data available from the International Benchmarking Network (IBNET) could be referred to for setting realistic objectives to be achieved for key efficiency indicators such as metering, collection and staffing ratios, energy consumption or non-revenue water (NRW). Objectives for the latter indicator have however to be set prudently:

- Expressing NRW as a percentage of water production is often misleading when per capita consumption decreases as a result of successful social connections programs or demand management through pricing and when the number of hours of service increases. It is often more representative to express NRW as losses in cubic meter per connection or per km of distribution network.
- Understanding the causes of NRW and assessing the economic justification of programs to be implemented for reducing it is essential to avoid major misunderstanding and disappointment (Box 7).

Box 7. Armenia – Managing Expectations with Regards to NRW Reduction

Until the mid-1990s, water was distributed only a few hours per day despite very high per capita water production of 885 lpcd in Yerevan and 670 lpcd in the secondary centers served by the utility AWSC. Since, the Government embarked on an in-depth institutional reform program and at the beginning of the 2010s, the WSS service in all urban centers of the country was provided by three professional private operators, whose contracts logically focused on increasing the number of hours of service and complying with bacteriological quality standards. Service improvements have been noticeable, but NRW has remained extremely high at 83 percent of the production in Yerevan and AWSC service areas. Physical losses increase with the duration of the service and about half of NRW is believed to result from physical leaks on poor quality distribution pipes and connections. The economic justification of replacing the latter has to be carefully assessed now that private operators have significantly reduced energy consumption and costs by refurbishing pumping plants and switching production to gravity sources whenever feasible. About half of NRW is believed to be of commercial origin, even if all apartment buildings are now equipped with quality...
meters belonging to the operators. But in the absence of condominium legislation, billing has to be established on the basis of the consumption metered or estimated for each apartment. Internal building plumbing are badly leaking and most individual meters, owned by the customers, are either inaccurate and/or tampered with. Replacing all individual meters with accurate anti-magnetic class C meter equipped with remote reading equipment is a project that private operators are considering. However achieving internationally accepted NRW of 20 percent or less is a long shot for Armenia. 

Source: Draft Project Implementation Completion and Results (PICR) reports of the Yerevan and Municipal WSS Projects; 2012.

### Identifying the Optimum CAPEX

If the focus has often been on reducing operating costs through financial incentives embedded in operation contracts, less attention has been placed on implementing the optimum CAPEX. The use of financial models similar to that described in Section 2.3b above could help identify the appropriate level of service, for example individual connections vs. public standpipes or simplified sewers vs. on-site sanitation, right balance between expansion of drinking water production and distribution systems and wastewater collection and treatment systems for meeting demand, generating additional revenues and complying with environmental regulations. Classifying the sub-projects considered according to their financial internal rates of returns (FIRR) should normally result in selecting those expected to generate the largest additional revenue or to significantly reduce operating costs.

### 2.4b Setting Tariffs for Managing Demand

**Past and Future Costs.** Tariffs estimated in Annex 1 for meeting “cash needs” or “utility costs” in fact reflect “past” costs. As hinted in these calculations, they may require steep increases each time a lumpy investment is needed, even if a cash reserve is built up beforehand. Also, because the less expensive sources of water are usually developed first, a tariff meeting the financial objective would normally be lower than that needed for covering the cost of developing the “future” infrastructure. Assuming that the demand decreases as the tariff increases, charging a tariff that simply recovers past costs will not give the proper signal to consumers to adjust their consumption to what is economically desirable. Figure 2 shows that in four utilities of the Baltic States, the average per capita consumption was divided by two, but still remained at very comfortable levels, as a result of tariffs increasing fourfold between 1994 and 2001.
**Marginal Costs.**\(^{24}\) Economic theory tells us that resources are efficiently used when prices are set according to marginal costs (Figure 3). An efficient use of resources implies that supply and demand are balanced at a level of consumption that maximizes total producer and consumer surpluses. In the case of WSS an increase of consumption by one cubic meter would, in the short run, only result in an increase of pumping and treatment costs. But the marginal cost would rise sharply as the capacity of the infrastructure is being fully used up and decline rapidly after extension of the latter. Since it is not practical to reflect steep variations of the short run marginal cost (SRMC) in tariff levels each time the infrastructure is extended, it is felt more appropriate to set the latter according to the long run marginal cost (LRMC) (Figure 4).

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\(^{24}\) Water Pricing: The Importance of Long Run Marginal Costs; London Economics for OFWAT (UK), 1997; and Estimation of Long Run Marginal Cost (LRMC); Marsden Jacob Associates for QCA (Australia), 2004
Average Incremental Cost. The average incremental cost (AIC), i.e., the tariff calculated by dividing the net present value (NPV) of the sum of CAPEX and incremental OPEX by the NPV of incremental sales is a good proxy for the LRMC. Because WSS infrastructure is depreciated over long periods, the planning horizon for estimating NPV should at least be 20 years to limit the influence of residual values on the result. Annex 1 provides an estimate of the AIC of water for the WSS utility for which various financial tariffs were earlier estimated; it is significantly higher than the financial tariffs. If applied, consumption is likely to be adjusted downwards meaning that major
capacity expansions could probably be postponed. This Note does not recommend pricing drinking water at LRMC as a principle, as in the case in Chile (Box 6) but suggests that AIC estimates should be systematically included in economic analysis of piped WSS projects for highlighting to governments reluctant to consider tariff adjustments the tariff the economic theory would recommend to be charged for maximizing benefits of both WSS consumers and the WSS supplier, thus the WSS sector economy as a whole.

**Metering or not Metering?** Managing demand through pricing implicitly suggests that production and consumption are metered and that bills are established on the basis of meter readings; the same applies to the proper monitoring of NRW. Figure 5 below, still using the example of utilities in four Baltic States show that per capita demand decreased notably as the metering ratio increased and, as shown in Figure 2, the tariff increased as well. The debate on the pros and cons of individual metering has definitively turned in favor of universal metering and there are multiple examples of WSS utilities, even small WSS service providers that are able to efficiently read and maintain individual meters. If the Bank has not recently published any paper on the topic, the International Water Association (IWA) has active groups working on improving the quality of metering while reducing its costs. Issues such as the economic justification of pre-paid meters of the reliability of meter readings when the water service is intermittent are addressed by such groups (Box 8).

**Figure 5: Baltic States: Effect of Metering on Consumption**
Box 8. Individual Metering: Issues and Options

When considering a metering program, WSS service providers have several issues to address. First, installing meters may require rebuilding house connections and tertiary distribution networks, an expensive and time-consuming task when in highly disorganized distribution systems dozens of long connections run in parallel in each street – the so-called “spaghetti” networks – to supply individual customers. Second, the meter selected has to be: (i) accurate enough for measuring small permanent flows, such as that of leaky toilet flush tanks; (ii) built to avoid tampering by the customer; and (iii) designed so that its reading cannot be manipulated by indelicate meter readers: anti-magnetic class C meters with remote reading device is an option to consider. Third, when the service is still intermittent the reliability of the meter reading has to be assessed: customers who may claim that meter mostly measure air flows when connections act as air release valves. Finally, when customers cannot save for paying monthly or bi-monthly water bills, pre-paid meters may be an option to consider, after a thorough economic analysis, as a means to match cash flows of low income customers. Other options designed to adjust payment of WSS bills to customer flows are based mobile money transfers: in Nairobi (Kenya), metered customers can access their WSS account and make a deposit at any time.

Source: Compilation of key topics on metering by the authors.

2.4c Setting Tariffs for achieving Equity

Customer Discrimination and Universal Access. WSS tariff structures should be designed to:

- Avoid discrimination of certain categories of customers. In Chile, for example, the Regulator is mandated to apply a uniform tariff per cubic meter of water to all customers served by the same WSS system, regardless of their category and of the quantity of water consumed (Box 6); and
- Encourage access to WSS infrastructure and a minimum consumption of water to improve public health. Still in Chile, because a uniform tariff could be unaffordable by low income households, the Government directs subsidies to low income customers to help them pay their water bills.

Quantity-Targeted Subsidies. Increasing block tariffs (IBTs) and volume differentiated tariffs (VDTs) are often preferred options for providing an affordable service to low income households through cross-subsidies between categories of customers. In an IBT structure, all consumers pay higher tariffs on successive increments of consumption. In a VDT structure, consumers who consume beyond a certain threshold pay higher tariff on the entirety of their consumption. It is often assumed that if well designed, such tariff structures favor access to a lifeline supply of water to low income households and discourage wasteful consumption by large consumers.25 It is also known

25 A “well-designed” IBT structure would for example: (i) limit the number of blocks to, say, to two or three; (ii) limit the ratio of the highest to lowest tariffs to say, two or three; and (iii) set the lower block to recover O&M costs so that
that if poorly designed, they could encourage undercharged customers to use more water than necessary and cause overcharged customers to opt out of the piped water service and increase the vulnerability of WSS service providers to the behavior of the small percentage of large customers who generate the bulk of their revenues. It is also known that these structures cannot easily achieve their goal when a single connection, such as a yard connection, supplies several low income households which together consume more than the lifeline supply. Finally it is suspected that these tariff structures encourage the manipulation of meter readings to artificially lower bills (against illegal payment to meter readers) and thus increase NRW. A comprehensive review of the performance of this type of subsidies has concluded that they often fail to achieve their objectives.\textsuperscript{26} The main reason being that the poor are usually not connected to piped water and sewers and cannot benefit from the subsidy. Another reason is that the difference of consumption between the poor and the non-poor, in particular the middle class, is often much lower than assumed. The same review highlighted that lowering the subsistence threshold, for example from 10 m$^3$/month to 6 m$^3$/month, has often had a minimal effect on targeting performance.

**Geographically Targeted Subsidies.** The comprehensive review mentioned above concluded that geographically targeting subsidies at low income areas within one WSS operation usually leads to better results than quantity-based subsidies. WSS service providers with regional or national coverage are often requested by governments concerned with regional disparities, to apply a single tariff to all customers and therefore to implement implicit geographical cross-subsidies.\textsuperscript{27} But a geographically uniform tariff could also encourage the implementation of large consumers in areas where water is expensive to produce; due consideration should be paid to differentiating tariffs that apply to large consumers to reflect local circumstances.

**Other Fees.** Upfront connection fees, security deposits or disconnection and reconnection fees, environmental taxes, value added taxes (VAT) are part of the tariff structure and affect the monthly bill. If improperly priced, these fees and taxes could distort demand and limit access to and consumption of WSS service by low income households. A detailed review of the monthly WSS bill should be part of any affordability analysis.

**Connection subsidies.** The above mentioned comprehensive review of subsidies does not conclude clearly on the performance of connection subsidies. If it has been demonstrated that free or highly subsidized water connections have been a key for successfully developing the piped water service in many African countries, it could still be argued that the poorest households still have to rely on public standpipes, when they exist, or on substitutes such as vendors or individual and often unsafe supplies when they do not.

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\textsuperscript{26} Water, Electricity and the Poor” Who Benefits from Utility Subsidies? Kristin Komives et al, the World Bank, 2005.
\textsuperscript{27} In Côte d’Ivoire, for example, revenues generated in the capital city Abidjan, where groundwater can be produced and distributed at low cost and the average per capita consumption and willingness to pay are relatively high, help operate a quality service in about 600 secondary cities, small towns and large villages which often rely on surface water and where average consumption and household revenues are lower.
**Fixed and variable tariffs.** WSS service providers typically have high fixed costs to cover, such as staff, depreciation or debt service. A two-part tariff including: (i) a fixed part, for example set according to the diameter of the connection; and (ii) a variable part proportional to the quantity of water consumed could help improve the WSS service provider’s cash flows when consumption is subject to high seasonal variations, but it would affect the budget of low income customers who consume small quantities of water.

2.4d **Regulating the Water Supply and Sanitation Service**

Reconciling the financial, efficiency, economic and equity objectives of tariff setting for protecting both the interests of consumers and that of a supplier placed in a monopolistic position is one of the main objectives of economic regulation of the WSS service. Monopoly abuse could result in (i) poor quality service; (ii) restriction of access; and/or (iii) high user fees to cover inefficiencies or artificially increase profit.\(^28\)

**Adapting Regulatory Arrangements to Local Conditions.** There is no “one-size-fits-all” solution for economic regulation of the WSS service and importing regulatory models designed for other countries is seldom a good option. In this context:

- Regulatory arrangements should be suited to the specific needs of the country, after proper definition of objectives pursued, analysis of the potential contribution of economic regulation to the overall sector accountability framework, specification of regulatory functions and choice of legal instruments and organizations in which to embed such functions. There are many examples (Morocco, Senegal, Uganda…) of WSS sectors that have made excellent progress meeting the above objectives without formal regulatory body but with clear regulatory instruments accepted and understood by all parties.
- If economic regulation is often associated with private participation in the provision of the WSS service, it is obviously needed when the WSS service is provided by a public agency.

**Ensuring Proper Operations of a Regulator.** The risk of regulatory capture by elected politicians, WSS service providers, customers or groups speaking on behalf of the latter is always high, in particular in developing countries, and the decision of establishing a regulatory body has to be made after a thorough analysis of the minimum conditions required for its proper operation. When envisaged, the following key principles should be reflected in its mandate and the instruments used to carry it out the regulatory function.\(^29\)

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\(^{28}\) Explanatory Notes on Key Topics in the Regulation of Water and Sanitation Services; Eric Groom et al; WSS Sector Board Discussion Paper Series no 6; The World Bank, 2006; and

\(^{29}\) Handbook for Evaluating Infrastructure Regulatory Systems; Ashley Brown; the World Bank, 2006.
Independence: the regulator should be insulated from short-term political pressures and be able to make decisions without prior approval from other government agencies; in particular, the regulator should be funded from independent sources of revenue such as a regulatory fee to be paid by the regulated entities.

Accountability: the parties whose interests may be affected by the regulator’s decisions should be able to appeal them.

Transparency: decisions should be supported by documentation to be made available to the public.

Predictability: decisions should follow principles and rules that can be amended only after extensive public notice; instruments used to support decisions and limit discretionary rulings, such as economic and financial models, should be understood and accepted by all parties.

Requisite powers: the regulator should have the power to perform its mission, including setting tariffs, monitoring market and service quality, addressing market power and designs, investigating and mediating consumer complaints, providing dispute resolution mechanisms, compelling provision of information and monitoring and enforcing its decisions.

Competence and compensation: education levels and compensation packages of the regulator’s staff should compare with that of the regulated entities; decisions should preferably be taken by a group of commissioners rather than by individuals; all decisions should be subject to appeal in a legally designated court or tribunal, which should have minimum regulatory expertise.

Integrity: the staff of the regulatory body should be subject to strict rules concerning conflicts of interest or the payment of “gratuities” of all kinds.

2.4e Building a Consensus on Cost Recovery from Users

Transforming Customers into Partners. As already pointed, financial sustainability is only one variable, albeit an important one, of an equation also aimed at providing universal access to a reliable, efficient, environmentally sustainable and equitable WSS service. The trust of the existing and potential customers in the capacity of the WSS service provider to improve the quality of the service is essential for ensuring payment of WSS bills that reflect its actual costs the service. If successful utilities in Africa (Uganda or Senegal), East Asia (Cambodia) or several Latin American countries have been able to transform their customer base into true partners through a combination of improvements and targeted marketing many in particular in South Asia, still lack the basic skills for implementing both.

Customers are not the only Stakeholders. Successfully reforming the provision of a WSS service requires a good understanding of the interests of the many stakeholders involved. If it may be rather easy to reach an agreement with a rural communities relying on point water supplies on their required financial contribution to the maintenance, and even future replacement, of pumps, it is much more difficult to bring all stakeholders on board for implementing tariffs and collecting bills in urban or rural piped WSS operations.

- National and local politicians may oppose any tariff adjustment for securing the votes of already connected middle class households.
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- Staff of the WSS service providers may oppose any program aimed at improving operational productivity or at implementing projects "unattractive" to engineers.
- Consumer associations may argue that tariffs cannot be adjusted before the quality of the service has significantly improved.
- Groups speaking of behalf of the poor may argue for a change of regulations that restrict extension of the WSS infrastructure to informal settlements where most of the poor live, for heavy cross-subsidies among categories of customers or even free service to the poor.
- Providers of substitutes, such as water vendors or suppliers of individual tanks and pumping and disinfection equipment, may attempt block projects aimed at improving the reliability of the service for protecting their revenues.
- Staff involved in fraudulent activities may oppose changes to current practices, such as installing reliable meters or enforcing disconnection for non-payment that would affect their illegal revenues.

Understanding the interests of the various stakeholders and how they are likely to be affected by changes – the "political economy" of the WSS sector – and mitigating the consequences of changes are essential element of successful reforms, including that aimed at recovering costs from users.

2.5 Subsidizing the Costs of the Water Supply and Sanitation Service

Designing Subsidies is also a Complex Exercise. If designing WSS tariff is complex, designing subsidies that are well targeted, transparent and time-limited is equally difficult: as already discussed, subsidies aimed at ensuring affordability of tariffs often fail to reach the poor (Section 2.4c). When the Bank extends a financing to a WSS service provider that does not yet recover its cash needs from its collection, an agreement has to be reached on a financial recovery plan and a reasonable timeframe for implementing it. In the meantime, government explicit or implicit subsidies have to be provided for either:

- Complementing collections from customers;
- Reducing the O&M costs of the WSS service provider;
- Reducing financing costs of the WSS service provider; and/or
- Mitigating the risks that should normally be borne by the WSS service provider.

The phasing out of explicit subsidies should be discussed in the financial recovery plan of the WSS service provider. The phasing out of implicit subsidies, should preferably be discussed when WSS sector policies are updated.

Complementing Cash Collection. Explicit subsidies aimed at complementing cash collection often take the form of:

- Cash complements: either (i) transferred on the basis of budgets prepared by WSS service providers, regardless of their actual technical, commercial or financial performances; or (ii)
Achieving Financial Sustainability and Recovering Costs in Bank Financed Water Supply and Sanitation and Irrigation Projects

- Disbursed on the basis of the achievement of an agreed performance improvement plan in an “output-based” mode; 30 and
- Direct payment to WSS service providers of bills issued to certain categories of customers, such as government agencies.

Reducing O&M Costs. Subsidies aimed at reducing O&M costs are typically provided as:

- Direct payment of operating expenses such as: (i) energy bills, a common arrangement for rural piped water systems; (ii) staff costs; or (iii) management costs, in particular when outsourced as part of public-private partnerships (PPP). These are all explicit subsidies. Management contracts, whose costs could represent a large share of O&M costs, usually include a foreign exchange component are often financed by an external source, such as an IDA credit. If the external financing is on-lent as a grant to the WSS service provider, this also constitutes an explicit operating subsidy; and
- Exemption of the payment of taxes (corporate tax, value added tax), import duties and/or environmental fees (implicit subsidy). 31

Subsidizing Financing Costs. Very few WSS service providers, and certainly not those that cannot recover their cash needs from collected user fees, have access to commercial debt for financing their CAPEX. Most of them rely on loans or development grants extended by governments or by government lending agencies. When loans are extended on more favorable terms than that that could be provided by commercial lenders, WSS service providers benefit from an implicit subsidy. A recent Bank Paper on this topic discusses options for making capital subsidies more transparent and better targeted (Annex 5). 32 The Paper also confirms that for building the borrowing capacity of the beneficiary WSS service provider, it makes more sense to extend smaller loans on conditions (maturity, grace period and interest rate) close to that of the market and to complement them with development grants, rather than extending loans on concessionary terms unrelated related to the market. Annex 5 discusses the pros and cons of various on-lending options. In countries where there is no debt money available on terms compatible with the characteristics of a sector that depreciates its fixed assets over very long periods, it is often difficult to define benchmark conditions. The Bank used to request IDA credits granted for urban WSS projects to be on-lent on IBRD terms to WSS service providers, after adjustment of the interest rate to reflect foreign exchange risk mitigation arrangements, if applicable. In such cases, IBRD terms could be considered the benchmark conditions. This

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30 When considering disbursing operating subsidies on an output basis, it preferable to select financial indicators such as actual collection from customers or working ratio rather than technical indicators such as NRW reduction or increased number of hours of service. During interim periods, governments should be urged to switch to declining output-based subsidies for encouraging performance. The recently approved “Program-for-Results” (PforR) financing instrument is well adapted to support such of subsidies extended to WSS service providers during their gradual move towards full O&M cost recovery.

31 A detailed analysis of income statements of corporate WSS service providers could help identify and value such implicit subsidies. When service providers do not issue financial statements, an analysis of the composition of operating costs could be carried out.

32 Capital Subsidies Implicit in Concessional Finance: How to make them more Transparent and better Targeted. William Kingdom et al, Water Papers, the World Bank, 2012.
practice has gradually been replaced by the more pragmatic one consisting in identifying the debt amount and terms that would match the estimated debt servicing capacity of the WSS service provider (Section 2.3b and Annex 5).

**Mitigating the Commercial Risk.** The commercial risk, i.e., the risk of issuing bills that do not reflect consumption and of not collecting them should normally be mitigated by WSS service providers. The latter face major challenges when bills are based on estimates consumption and when disconnection of customers in arrears is not allowed.

- Billing systems established on normative consumptions, such as diameters of connections or numbers of rooms of the dwelling are seldom satisfactory. They implicitly encourage customers not to repair leaky indoor plumbing or to engage in the retail of water. Individual metering should be an objective to be pursued by most WSS projects, and the costs of supplying, installing meters should be part of WSS service providers’ CAPEX that could be financed by explicit development grants. The cost of managing the meters should however be financed by user fees.
- By not allowing the disconnection of customers in arrears, governments implicitly encourage bad behavior. Allowing disconnection of customers in arrears, a policy matter rather than a financial support should also be an objective of most WSS projects.
- Collection from public customers is often problematic. In many African countries, bills issued to government agencies represent between 15 and 20 percent of the total billing and their non-payment forces cash short WSS service providers to delay payment of social security and other taxes, debt service and even energy bills. Relying on write off of mutual arrears through periodic compensation exercises involving governments, financiers, suppliers and WSS service providers is an unhealthy practice that deprives both governments and WSS service providers from cash resources. Countries that have succeeded in establishing the financial sustainability of their WSS sectors, such as Tunisia or Senegal, have implemented clear budget preparation and execution procedures and/or initiated major overhaul of internal plumbing of government buildings for limiting water consumption.

**Subsidizing the Foreign Exchange Risk.** Because WSS service providers generate revenues in local currency they have limited options for dealing with creeping or shock devaluations (Section 2). When governments on-lend funds raised from international financing institutions to WSS service providers in local currencies without applying a markup on the interest rate to reflect the foreign exchange risk taken, they implicitly subsidize WSS service providers.

### 2.6 Hallmarks of Good Coverage of Financial Sustainability Issues

**Improving Quality Enhancement Reviews.** A review of key elements of PAD for 16 WSS projects approved since the beginning of 2010 (Annex 4) has highlighted the differences between

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33 In Côte d’Ivoire, a country where the water service has been efficiently provided by a private operator since 1959, about 15 percent of residential customers were, until the civil disturbances of the early 2000s, at any point in time temporarily disconnected, and reconnected as soon as arrears were settled: the collection ratio from residential customers was in the 98 percent range.
the coverage of procurement, financial management, environmental safeguards and social safeguards issues and that of financial sustainability of the agency(ies) implementing the project. If fiduciary and safeguard issues are covered according to strict standards, that applying to financial sustainability seem to be open to interpretations. They can even be ignored: several PAD include a financial appraisal that complies with OMS 2.20. The minutes of Quality Enhancement Reviews (QER) of WSS projects should include a specific Annex to confirm that:

- The Project Development Objectives (PDO) do mention the achievement of the financial sustainability of the agency(ies) implementing the project and the recovery of “cash needs” associated with the project from collected user fees as one of the key objectives;
- The financial analysis includes a discussion of: (i) whom the Bank is lending to by attaching an analysis of the past audited financial statements and of the expected future financial performance of the agency(ies) implementing the project and, if relevant, a detailed action plan for correcting shortcomings; and (ii) what is the Bank lending for by attaching estimates of the NPV of future cash flows and FIRR of the proposed project;
- The Results Framework (RF) does clarify how financial sustainability and cost recovery are defined within the context of the project and proposes monitoring indicators adapted to the financial issues to be addressed;
- The financial covenants are fully consistent with results to be achieved, as described in the RF, and are enforceable; and
- The Operational Risks Assessment Frameworks (ORAF) address in a candid manner the various risks that could affect the financial sustainability of the implementing agency(ies) and the recovery of costs associated with the project, beyond tariff adjustments.

**Project Development Objectives.** All PDO should discuss the financial performance of the WSS service provider(s) implementing or benefitting from the project. In this context:

- When the WSS service provider(s) already recover(s) O&M costs, services the debt and contributes cash to the CAPEX, the PDO could simply refer to the minimum debt service coverage ratio and cash contribution to the CAPEX (or alternatively a minimum rate of return on assets) to be achieved;
- When this is not yet the case, the PDO should normally set project completion for achieving this objective; and
- If the latter is not feasible, the PAD should clarify which coverage of O&M costs, debt service and contribution to the CAPEX is to be achieved by project completion.

**Financial Analyses.** For urban WSS projects implemented by WSS utilities that use accrual accounting, the financial analysis should include a summary of past audited financial statements (income and cash flow statements and balance sheets) for a minimum of three years, as well as a summary of the same statements for the coming ten years supported by a description of the key assumptions made. Select ratios to monitor O&M costs coverage, liquidity or capital structure should be estimated and compared with industry standards, such as that provided by IBNET. In case ratios are significantly below the latter, the financial analysis should describe the agreed action plan for correcting shortcomings. For urban WSS and rural WSS projects implemented by

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34 The financial forecast should be extended at least to the year during the first payment of the principal of the loan extended for the project is to be made.
entities, such as government departments or water user associations that use cash accounting, the financial analysis should include a summary of past and future cash revenues, cash expenses and debt service as well as a summary of assumptions made. As for the above, the agreed action plan for achieving recovery of cash needs from collected user fees should be described. In both cases incremental revenues and expenses resulting from the project should be identified to allow estimates of the net present value (NPV) of future cash flows and financial internal rate of return (FIRR) of the project.

The financial analysis should also clarify how explicit and implicit subsidies are provided to WSS service providers, and estimate their current and future amounts. This analysis should in particular discuss:

- How central, regional or local government budgets complement collections from users for covering the cash needs of WSS service providers and if any conditionality is attached to such financial support;
- If WSS service providers are exempted from paying taxes, import duties or fees (bulk water fee, discharge fee) legally applying in the country;
- If WSS service providers are likely to benefit from other implicit subsidies through, for example, the payment of inflated bills to public customers;
- If on-lending terms are affordable by WSS service providers and how governments (or public lenders) meet their own obligations to their lenders; and
- How WSS service providers are protected against exchange rates variations.

**Box 9. Using the Findings of Public Expenditure Reviews**

The above analyses, carried from the perspective of WSS service providers, could be complemented by the findings of public expenditure reviews (PER) in WSS sectors. Since 2003, the Bank has undertaken 42 PER that, depending upon the case, cover urban WSS, rural WSS or a combination of both, of which 15 in Africa. If typically PER discuss access to WSS infrastructure, the levels of expenditures, funding sources, the split between capital and recurrent expenditures and budget execution, they also discuss sector policies and institutional arrangements. Although, according to the authors of these reviews, standardizing the methodology for preparing PERs in WSS is neither feasible nor desirable, they usually aim at identifying who should pay for costs that are not covered by user fees and ways to increase effectiveness, efficiency and predictability of WSS public spending. PER usually do not provide the information in the above format and thus cannot always directly address IEG request for clarification on cost sharing. Terms of Reference for future PERs could be more specific and request that:

- Cost recovery policies and their actual implementation are discussed for each sub-sector; reasonable estimates of O&M costs, billing and collections by WSS service providers should be provided.
- Financing mechanisms including procedures for applying for operating subsidies, development grants and long-term debt, reviewing and appraising applications, and disbursing funds be discussed;
- Financing conditions (equity, grants, long term debt, foreign exchange risk…) be clarified; and
Implicit subsidies be identified and is possible valued.

Source: Review of Review of PER by the authors

**Results Frameworks.** RF should clarify what is meant by the terms “financial sustainability” and “cost recovery” in the context of the proposed project by providing:

- Definitions that could be copied *verbatim* in legal documents;
- Identify a series of financial indicators that are representative of the issues to be addressed;
- Set deadlines for achieving them; and
- Propose intermediate results indicators.

The Water Sector Board could also adjust its “Core WSS Indicators” and replace the “number of WSS utilities benefitting from the Project” by the “number of WSS utilities benefitting from the project that recover their O&M costs, including provision for bad debts, variations of working capital and repay their debt from collected user fees”.

**Operational Risks Assessment Frameworks.** ORAF should include an analysis of the various factors that could affect:

- Revenues, such as demand elasticity and willingness to pay, tariff adjustments and willingness to charge, efficiency of commercial procedures, such as disconnection policies for non-payment;
- O&M efficiency of operations such as NRW, energy consumption and staffing and risk of creeping or shock inflation;
- Capital costs, such as cost overruns; and
- Debt service, such as foreign exchange variations.

ORAFs should also describe concrete mitigation arrangements to address each of the above risks:

- Adjustments of tariff levels and structures and application of automatic cost index adjustment formulas, legislation for allowing disconnection of customers in arrears, preparation of water consumption budgets of government agencies;
- Incentives for achieving planned efficiency gains; and
- Foreign exchange mitigation.

**Financial Covenants.** They should be tailored to the financial sustainability and cost recovery objectives pursued by the project and address in all cases the coverage of cash needs from collected user fees. In addition for WSS service providers operated as corporate entities, they should clarify the debt service and liquidity ratios as well as the capital structure (ratio of debt to equity). The wording used in legal documents and PAD, including the RF and the ORAF should be identical and terminology used should be clarified.
2.7 Applying Theory to Practice: Locating Utilities on the Financial Sustainability Ladder

If OMS 2.20 is very precise on the content of the financial analysis to be carried out, it leaves teams free to tailor project components aimed at establishing the financial sustainability of the beneficiary WSS service provider and adapt financial covenants for addressing its specific needs. In this context, it may be helpful to roughly categorize the service provider as:

- A “struggling WSS service provider”,
- A “developing utility” or
- A “performing utility”.

A “Struggling WSS Service Provider” may or may not be an autonomous corporate entity. It is likely to be characterized by outdated customer registry, inadequate metering, low bill collection, manual cash accounting, outdated tariff setting procedures (if any), and heavy reliance on operating subsidies to finance its O&M costs. Its financial recovery program should focus on the establishment of a corporate entity operating according to commercial principles, the implementation of a technical assistance (TA) or public-private partnership (PPP) with incentives for increasing cash generation through a combination of efficiency gains and gradual tariff adjustments aimed at recovering 100 percent of O&M costs within a “reasonable” timeframe, hopefully corresponding to the project completion. Obviously a struggling WSS service provider, that does generate cash surpluses should be allowed finance its development only on grant terms, as it cannot service a debt.

A “Developing Utility” is likely to have significantly improved commercial and financial management procedures, and a tariff policy allowing the recovery of cash needs from collection. Because such a utility is likely to have limited cash surpluses to service its debt, it would be allowed to borrow only from the government or government lending arms and debt terms would have to be tailored to its repayment capacity.

A “Performing Utility” is likely to generate operating revenues sufficient to cover its O&M and financing costs, depreciate its fixed assets and pay an income tax on its operating profit. Such a utility may still have to rely on public financing, but on terms closer to commercial ones and may even be allowed to borrow on commercial terms without a government guarantee.

Applying the primarily theoretical discussion of this paper to the above categories, Table 1 can be used to identify utilities and then focus Bank support to help them climb up the financial sustainability ladder.
### Table 1: The Financial Sustainability Ladder: Definitions and Focusing Bank Support

<table>
<thead>
<tr>
<th>Main Characteristics</th>
<th>Struggling Service Provider</th>
<th>Developing Utility</th>
<th>Performing Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Management</strong></td>
<td>• Limited technical, commercial and financial capabilities; • Frequent rotations.</td>
<td>• Stable management team; • TA, or PPP, to help achieve technical, commercial and financial objectives.</td>
<td>• Stable management team; • PPP, if any, achieving technical, commercial and financial objectives.</td>
</tr>
<tr>
<td><strong>Technical Operations</strong></td>
<td>• Poorly maintained and operated water production &amp; distribution facilities, sewers &amp; wastewater treatment facilities; • Intermittent water supply; • High volume of physical and commercial leaks and NRW; • Less than 95% of drinking water samples meeting bacteriological standards; • Sewers overflowing.</td>
<td>• Gradually rehabilitated facilities; • Extensions implemented according to well justified CAPEX; • (Almost) permanent water supply; • NRW program under implementation and NRW gradually reduced; • 98% of drinking water samples meeting bacteriological standards; • Sewers conveying effluents to treatment site.</td>
<td>• Significant budget devoted to maintenance; • Extensions implemented according to well justified CAPEX; • Permanent water supply; • NRW maintained at low level (below 20%); • 99% of samples meeting bacteriological standards • Wastewater treated and effluents meeting standards.</td>
</tr>
<tr>
<td><strong>Commercial Operations</strong></td>
<td>• Outdated or inexisten customer registry; • Inadequate bulk and individual metering; • Inadequate billing procedures; • Low collection from private and public customers; • No disconnection for non-payment.</td>
<td>• Updated customer registry; • Universal bulk metering; • Metering of large customers and most customers; • Computerized billing; • Collection from private customers above 90%; • Payment by public customers under control; • Disconnection for non-payment enforced.</td>
<td>• Universal metering; • Collection above 95%; • Accounts receivable below 90 days of billing; • Disconnection for non-payment enforced.</td>
</tr>
<tr>
<td><strong>Financial Management</strong></td>
<td>Cash accounting;</td>
<td>Accrual accounting;</td>
<td>Accrual accounting;</td>
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<tr>
<td>-------------------------</td>
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<tr>
<td></td>
<td>Manual accounting;</td>
<td>Computerized accounting;</td>
<td>Computerized accounting;</td>
</tr>
<tr>
<td></td>
<td>Inadequate and/or qualified audits.</td>
<td>Financial statements independently audited;</td>
<td>Financial statements independently audited;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Audit qualifications taken care of.</td>
<td>No audit qualifications.</td>
</tr>
<tr>
<td><strong>Financial Performance</strong></td>
<td>Outdated tariff level and structure;</td>
<td>Tariff policy in place;</td>
<td>Tariff policy implemented;</td>
</tr>
<tr>
<td></td>
<td>Collection covering a fraction of O&amp;M costs;</td>
<td>Collection covering “cash needs”;</td>
<td>Billing covering O&amp;M costs, depreciation and return on assets;</td>
</tr>
<tr>
<td></td>
<td>Heavy reliance on operating subsidies;</td>
<td>Operating subsidies phased out;</td>
<td>Income tax paid;</td>
</tr>
<tr>
<td></td>
<td>CAPEX entirely financed on grant terms.</td>
<td>CAPEX financed on concessionary terms adapted to repayment capacity;</td>
<td>CAPEX financed on mix of concessionary and commercial terms adapted to repayment capacity;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cash generation contributing to CAPEX.</td>
<td>Cash generation contributing at least 25% to CAPEX.</td>
</tr>
<tr>
<td><strong>Focus of possible Bank Support</strong></td>
<td>Establishing corporate entity and commercial environment;</td>
<td>Increasing cash generation from operations through increased collection and efficiency gains;</td>
<td>Ensuring stability of future cash flows;</td>
</tr>
<tr>
<td></td>
<td>Financing strong TA or PPP component;</td>
<td>Financing PPP, if any, by operating revenues;</td>
<td>Financing PPP, if any, from operating revenues;</td>
</tr>
<tr>
<td></td>
<td>Focusing CAPEX on rehabilitation and limited extensions;</td>
<td>Targeting CAPEX on fully justified extensions;</td>
<td>Targeting CAPEX on fully justified extensions;</td>
</tr>
<tr>
<td></td>
<td>Creating incentives for reducing costs and increasing cash generation;</td>
<td>Implementing pro-poor policy;</td>
<td>Implementing pro-poor policy;</td>
</tr>
<tr>
<td></td>
<td>Implementing gradual tariff adjustment for meeting 100% of O&amp;M costs within “reasonable” time frame.</td>
<td>Ensuring that “cash needs” are covered by end of project.</td>
<td>Ensuring that operation generates an operating profit.</td>
</tr>
<tr>
<td><strong>Financial Objectives and adapted Covenants</strong></td>
<td>Gradual recovery of O&amp;M costs and phasing out of operating subsidies from collection (working ratio covenant);</td>
<td>Recovery of cash needs covenant (O&amp;M plus debt service plus provision for bad debts plus variation of working capital);</td>
<td>Recovery of cash needs covenant (O&amp;M plus debt service plus provision for bad debts plus variation of working capital);</td>
</tr>
<tr>
<td>Positive cash position (current ratio covenant).</td>
<td>Cash contribution to CAPEX (cash generation covenant); Positive cash position (current ratio covenant); Limiting debt (debt service coverage ratio covenant).</td>
<td>Cash contribution to CAPEX (cash generation covenant); OR Return on assets covenant; Limiting debt (debt service coverage ratio covenant); Capital structure covenant (Debt/debt + equity ratio).</td>
<td></td>
</tr>
</tbody>
</table>

| Adapted On-lending Terms | Grant terms; FOREX risk borne by Government. | Mix of development grants and concessional loans; FOREX risk borne by Government | Mix of loans by Government on concessional and commercial terms; Limited commercial loans; FOREX risk borne by Utility with well-designed mitigation arrangement |
PART 3: FINANCIAL SUSTAINABILITY AND RECOVERING COSTS IN IRRIGATION

3.1 Principled Pragmatism: Distinguishing the Essential from the Desirable

The history set out in Part 1 above, and in particular the near-identical range of issues described in 1980 and 2010 suggest that significant changes are required in the Bank's approach to treatment of O&M in its projects. The 2010 IEG report provides clear direction that such change is necessary. Change, in the context of a particular country, will involve both principles and pragmatism – principles because a well-designed charging system provides many benefits in any context, and pragmatism because the rate and extent of innovation in this sensitive area must be tailored to circumstance.

In the paragraphs that follow, the beneficial influences that the components of a well-designed charging system bring into play are summarized. The first of these is essential, and failure to incorporate and enforce conditionality required has contributed most significantly to the cycle of building, deterioration and rebuilding that has characterized so many projects. The rest are desirable but not necessary, and can be included over time to the extent possible.

- **It is essential that the resources available to system managers are fully adequate to support continuing provision of the specified service.** Various sources of funding to meet the total requirement are possible: direct charges on beneficiaries for service, subsidies from government derived from other taxes, or cross-subsidies from one water service to another (e.g. from hydro-power services to irrigation, or from industrial users to domestic). The ultimate guarantor must be government, and this contribution must be explicitly identified in the budget as a subsidy.

- **It is desirable that beneficiaries contribute significantly to the costs of service delivery.** A link between the service charge and the costs incurred in service provision will improve the relationship between beneficiaries and water agencies. If farmers are paying for the service, they will be more attentive to the efficiency of the agency because they are (wholly or partly) paying the agency. Excessive manpower, poor working practices, opportunities to improve the service at no cost will all be of interest to the beneficiaries, and this will not be the case if “the government” provides the service and the beneficiaries are completely disconnected from its cost.

- **It is desirable that charges are related to service.** Where service charges are waived, the largest subsidy is to the largest users – a highly regressive outcome. Moreover, the least privileged farmers (who do not have water services) get neither the capital subsidy from the original investment nor the ongoing subsidy to O&M.

- **It is desirable that charges provide incentives for conservation.** In many scenarios (standpipes, most large surface irrigation systems serving small farmers) measurement of water delivered to individual users is impossible. However, in designing a service and the related charges, consideration should be given to any practical strategies to encourage

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35 O&M is used here as a shorthand for the total expenditures required for continuous provision of a specified service. This will include recurrent, day-to-day costs of personnel, fuel and equipment as well as the substantial outlays required on a regular basis for replacement of ageing facilities, rehabilitation and modernization.
Achieving Financial Sustainability and Recovering Costs in Bank Financed Water Supply and Sanitation and Irrigation Projects

Achieving the first, essential objective will be difficult, and is clearly not being met in the majority of irrigation projects – but the alternative continuing cycle of deterioration, under-performance and rehabilitation serves no-one’s interest.

**Box 10: Matching Prices to Purpose: Australia, Murray-Darling**

Water in the Murray-Darling (M-D) basin is extremely scarce, and year-to-year fluctuations in availability are extreme. Many aspects of the M-D are quite different from the typical developing country context – holdings are large, the farmers are commercially oriented, and delivery schedules are responsive to the needs of the individual farmer. But as elsewhere, three issues are of concern to the various stakeholders: ensuring that financial resources are adequate for long-term sustainability of the infrastructure; avoidance of non-productive water use; and facilitating reallocation of water from lower to higher value uses.

These three objectives are met through three quite separate pricing mechanisms. First, given the highly variable stream flows, a purely volumetric charging system would result in extremely unstable revenues for the operating agency. Farmers therefore pay a fixed annual service fee related to their nominal water entitlement regardless of whether water is actually delivered or not. During the recent drought, some farmers paid $4-500 per hectare and received NO water.

Second, to encourage water conservation, there is a volumetric charge that provides an incentive for farmers to reduce usage (though in practice, water is usually so short that farmers take whatever water is allocated to them).

Third, trading of water rights is allowed, both on a temporary and permanent basis, so that, for example, farmers can sell water rights if they believe the price is better than the profit they could make from irrigation.

Such a complex system requires sophisticated monitoring and oversight – but the practical message is that multiple objectives require multiple tools.

### 3.2 Ensuring Financial Sustainability

In this section, the required documentation of the current and planned situation for a typical project is set out. Assembling the data will typically be difficult – much will not be recorded, or recorded as part of other budgets that are not easily disaggregated – but this step provides the most important basis for negotiation and clarification of financial responsibilities. The estimates will require constant refinement over time, but the principles agreed in the first round will provide a sound basis for the corresponding adjustments to future contributions.

**Current Status.** Tabulate actual expenditures on O&M for recent years (5-10), broken down into (at least):

- Staff costs (full time and part-time field operations staff; managers; administration (record keeping, billing, collection of fees)). Indicate proportion of staffing costs relevant to O&M (some staff may work on more than one project; some may have other duties as well as irrigation).
Achieving Financial Sustainability and Recovering Costs in Bank Financed Water Supply and Sanitation and Irrigation Projects

- Maintenance and depreciation of equipment fleet
- Consumables (fuel and oil; electricity for pumping; office supplies for administration; miscellaneous construction/maintenance materials)
- Contracted services (payment to contractors for O&M related work, minor repairs, etc).
- Non-recurrent expenditures (rehabilitation, modernization, major repairs and replacements)

This table may be repeated at different levels in the system (basin, irrigation project, water user associations – WUA, etc) depending on the structure of O&M. This will also clarify the contribution of other beneficiaries (hydro, navigation, flood control, domestic and industrial water supply, etc) to the total system.

**Future Program.** Required expenditure to meet specified service standard:
- Qualitative description of current service to farmers, focusing on equity (head-tail), reliability, and scheduling. Is the service defined (i.e. is the timing and quantity of deliveries to farmers specified and followed)? Is the service stable? Adequate? Deteriorating?
- Projected tabulation of expenditures under headings prescribed above, at various operating levels, required to meet acceptable service standard, including:
  - immediate rehabilitation costs
  - estimated future expenditures for sustainable O&M
  - anticipated future major replacements and repairs (10-20 year horizon)

**Sources of Funds**
- What are beneficiaries (including, at some levels in the system, non-agricultural users) billed for water services?
- What are collections?
- What does government currently contribute?
- Tabulate the summary schedule of expenditures (by level – basin, project, WUA) against current revenues.

**Financing Plan**
The preceding analysis will in all probability show:
- A gap between current expenditure and current revenues from beneficiaries
- A large short-term gap between revenues and expenditures required for rehabilitation/modernization to meet the agreed service level
- A gap between future expenditure required for adequate O&M

To meet the *essential* objective of ensuring that system managers have adequate resources to operate and maintain facilities in a sustainable manner, resources have to be identified to bridge the gaps identified – including in the immediate future, to ensure that deterioration of facilities is halted.

For rehabilitation and modernization, project funding will be required, from the Bank, the government, or a financial intermediary. The associated repayment schedule then becomes part of the future schedule of financial obligations on the sector. The continuing financial needs of the project can then be discussed and agreed with government as the Borrower. Options for bridging the financial gap include:
Achieving Financial Sustainability and Recovering Costs in Bank Financed Water Supply and Sanitation and Irrigation Projects

- Increasing collections of payments due from all beneficiaries under the present charging regime
- Increasing charges to some or all beneficiaries
- Identifying new revenue sources
- Subsidy from government

The outcome of these discussions will be entirely location-specific, and may well depend on existing national policies about which elements of the system are the responsibility of government, and which are to be paid by users, and whether capital costs should be recovered partially or fully. The outcome of these discussions will comprise at least three elements that are of prime importance to the irrigation sector: first, an initial estimate of the funding requirements for sustainable O&M; second, a commitment from government to be the funder of last resort in ensuring that resources are adequate to meet these needs (see Box 11); and third, an estimate of the funds to be raised from beneficiaries of irrigation services.

Box 11: Engaging Government

In 1995, the World Bank funded an irrigation sector loan to the state of Haryana in northern India (where the irrigation facilities cover some 3 million hectares – Haryana would be among the top 20 countries in the world by irrigated area). The state was keen to expand facilities to new areas, but O&M was entirely inadequate. During appraisal, careful estimates were made of the budget required, and the shortfall in funds provided. An investment program for the duration of the project was developed that limited the funding for expansion to what was left after provision of O&M funds. This caused an immediate review of who was using water (it was found that towns were drawing from canals without payment), and what users were paying (raising charges to industrial and commercial users substantially, on the grounds that they received preferential supplies in times of scarcity. Irrigation charges were also doubled, and O&M costs were brought into approximate balance with revenues. The first step – linking something that the government wanted to progress in O&M funding was critical in getting political attention and support to the difficult decisions required.

This last element opens the next round of the process – setting irrigation charges at levels consistent with recovering the agreed share of the project. The necessary charges should be tested against the incremental income that beneficiaries derive from irrigation services. This can be based on a fairly simple estimate of net farm income with irrigation compared to net farm income without irrigation – a test that should also confirm that it is appropriate that those privileged to receive irrigation can afford to pay for it.

Setting the Charges. The table below sets out the main types of irrigation service charge from the perspective of their impact on demand for water. Quotas and tradable water rights are not charging systems, but they are a means of managing the allocation of water between users and sectors and should thus be considered and compared with pricing as a demand management tool.
A few points should be noted in understanding how the various charging systems create incentives that relate to the objectives. First, *area-based charges*, if set high enough, will simply discourage any irrigation. However, if the farmer does irrigate and pays the related flat charge, there is no *marginal* incentive to save water. *Volumetric* water pricing does have this *marginal* impact, but it is much harder to administer, requiring individualized service and measurement. *Quota and tradable water right systems* encourage high productivity, and set limits to how much water is used, but they do not encourage water saving beyond the quota or water right level – users will tend to take or trade their full entitlement.

### Table 2: Bases for Charging and Demand Management impacts

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Impact on Productivity</th>
<th>Impact on Demand</th>
<th>Can assure supply-demand balance?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area-based</strong></td>
<td>a) A fixed rate per hectare of farm, unrelated to the area irrigated, crop grown or volume of water received. This type of charge is commonly the fixed element of a “two part” tariff, designed to cover the fixed costs of the service.</td>
<td>None</td>
<td>None</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>b) A fixed charge per hectare irrigated, and not related to farm size, type of crop grown, or actual volume of water received.</td>
<td>None</td>
<td>Small</td>
<td>No</td>
</tr>
<tr>
<td><strong>Crop-based</strong></td>
<td>A variable rate per irrigated hectare of crop i.e. different charges for different crops. The service charge is not related to the actual volume of water received but the type of crop and area irrigated are proxies for the volume of water received.</td>
<td>Small</td>
<td>Small</td>
<td>No</td>
</tr>
<tr>
<td><strong>Volumetric</strong></td>
<td>a) A fixed rate per unit water received, where the service charge is directly related to, and proportional to, the volume of water received.</td>
<td>Positive</td>
<td>Positive</td>
<td>Very difficult</td>
</tr>
<tr>
<td></td>
<td>b) A variable rate per unit of water received, where the service charge is directly related to the quantity of water received, but not proportionately (Thus, a basic amount of water per</td>
<td>Positive</td>
<td>Positive</td>
<td>Difficult</td>
</tr>
</tbody>
</table>
hectare may be provided at a low unit cost, and additional water at a higher unit cost.) This is a rising block tariff.

<table>
<thead>
<tr>
<th>Quota or rationing</th>
<th>Entitlement to water is defined (absolutely, or qualified by actual availability)</th>
<th>Positive</th>
<th>Controlling</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tradable water rights</td>
<td>Entitlement to water is defined (absolutely, or qualified by actual availability) and may be sold to other users seasonally or in perpetuity.</td>
<td>High</td>
<td>Controlling</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes:
“Small” – essentially no impact, except at extreme (and unlikely) charging levels.
“Positive” – impact will be in desired direction, with magnitude dependent on level of charge.
“High” – impact substantial independently of chosen charging system.
“Controlling” – Specifies the maximum demand that will be satisfied under different supply conditions.

Additionally, in choosing the basis for charging, it is important to consider the perspective of the agency responsible for assessing and collecting charges: its priorities relate most strongly to ease of administration and stability of revenues – issues that have had limited attention in the international debate about the role of irrigation service charges (ISC) in improving water management.

Table 2 relates the same set of ISC described above to these concerns. It is immediately noticeable that the two tables – representing two perspectives on the potential role of various types of ISC – present conflicting results. The best performing “demand management” options are generally more difficult to administer and less certain in their revenue outcomes.

**Table 3:** Basis for Charging, Revenue Stability and Ease of Administration

<table>
<thead>
<tr>
<th>Type</th>
<th>Description (for Detail see Table 1)</th>
<th>Stability and Predictability of Revenues</th>
<th>Ease of Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area-based</strong></td>
<td>Fixed charge per hectare of farm.</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td>Fixed charge per hectare irrigated.</td>
<td>Moderate</td>
<td>Good</td>
</tr>
<tr>
<td><strong>Crop-based</strong></td>
<td>Variable charge per irrigated hectare of crop.</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Volumetric</strong></td>
<td>A fixed rate per unit water received.</td>
<td>Poor</td>
<td>Poor</td>
</tr>
</tbody>
</table>
### Achieving Financial Sustainability and Recovering Costs in Bank Financed Water Supply and Sanitation and Irrigation Projects

<table>
<thead>
<tr>
<th>Charging Basis</th>
<th>Description</th>
<th>Revenue Stability</th>
<th>Ease of Administration</th>
<th>Tradable Water Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A variable rate per unit of water received.</strong></td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td><strong>Quota or rationing</strong></td>
<td>Entitlement to water is defined.</td>
<td>Not relevant¹</td>
<td>Variable²</td>
<td></td>
</tr>
<tr>
<td>** Tradable water rights**</td>
<td>Entitlement to water is defined and tradable.</td>
<td>Not relevant¹</td>
<td>Poor³</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Revenue level and stability depends on selected charging basis.
2. Ease of administration for quotas depends on the nature of quota: proportional division of water, uniformly across the irrigated area provides an exceptionally simple system to administer; seasonally variable allocations with varying schedules of delivery are complex to administer.
3. Tradable water rights are complex to administer, combining the difficulties of a sophisticated quota system with the additional need to adjudicate on the third-party impacts of transfers.

The final consideration from the agency’s perspective is whether the irrigation service implied by the charging basis is technically feasible. Area and crop-based systems do not necessarily specify the nature of the irrigation service as an input (volume, flow rate, timing and duration) – rather the service is defined on the basis of the outcome (a certain area to receive water and a crop matured successfully). Volumetric charging, on the other hand, requires detailed measurement of the water supply. Furthermore, if there is to be an incentive to use less water at the individual farm level, the possibility must be in place to provide a controlled and individualized service at that level. Tradable water rights also require this differentiation of supply at the level that water is to be traded. Very few surface irrigation systems in developing countries are capable of such operation. Only a proportionally based quota system such as warabandi avoids the need for adjustments to deliveries at the individual farm level, making management much easier.³⁶

### 3.3 Concluding Remarks and Recommendations

Throughout Part 3, two themes have recurred: that the present situation of recurrent collapse and rehabilitation is unacceptable, and that every situation has its unique constraints and opportunities. The process outlined above will be a challenge in most projects, because we typically do not know how much is spent on O&M, and we do not know how much should be spent, and the gap is likely to be a political problem. The process will thus inevitably be iterative, and the first estimates will in all probability be “wrong”. In fact the dialogue with government that will be forced by the process will probably be the most important step forward in achieving a good system of cost recovery. Once faced with the extent of subsidies required, many governments will be far more willing to engage in politically difficult debates with constituents about who should be paying for what, and as

³⁶ Warabandi, as institutionalized in Pakistan, is a rotational method for distributing a restricted supply of irrigation water in an equitable manner over a large command area, with fixed time allocations based on the size of landholdings of individual water users.
those constituents are progressively faced with the real costs, they in turn may question the working practices of the operating agencies, and identify options for more cost effective approaches. The conflicting perspectives of the stakeholders should also be recognized: irrigation agencies want stable and adequate resources; some politicians will not want increasing charges for their voters; other politicians will not wish that privileged farmers are subsidized; farmers do not want to pay much – but they do want a good service. Transparency is the best catalyst to allow these perspectives to be reconciled.

In designing a charging system, the Bank must be patient and consistent; demand management through sophisticated charging and metering systems is inconceivable with the infrastructure in place in most projects. Transformation of bureaucratic government departments into responsive, cost-conscious market oriented agencies will take years. Pretending these things will happen overnight is a sure route to failure.

Fundamental underpinning of these transitions will be provided, at a minimum, by the following:

- A covenant to the effect that: **The Government would ensure that resources are available to the operating agency such that the irrigation service is delivered in accordance with the agreed service plan.**
- A regularly updated statement of billings, revenues, subsidies and expenditures to confirm that resources are adequate to the agreed program of funding.
- An annual statement of performance, related to the defined irrigation service that the system is designed to provide: this should be simple, and focus on two or three “key indicators” that capture essential elements of the service plan.
PART 4: RECOMMENDATIONS FOR TASK TEAMS, THE WATER SECTOR BOARD AND THE WATER ANCHOR AND ON DISSEMINATION

Parts 1, 2 and 3 of this Note have highlighted some quality control issues with regards to the coverage of financial sustainability and cost recovery from users in PAD of water projects. The first set of recommendations is directed at TTL and managers and peers that review their outputs.

The Water Sector Board and the Water Anchor both have important roles to play in helping to ensure that another 30 years of stagnation does not occur before making real progress in achieving financial cost recovery in the water sector.

It is important that this Note be disseminated to headquarters and field staff by using the most appropriate communication technology available. As it should eventually evolve into a Guidance Note, staff feedback is important.

4.1 For Task Team Leaders

- Define and quantify the expenditures required in the medium term to ensure financial sustainability of the project or the service provider;
- Define the responsibility for meeting such costs between the beneficiaries/users and the government/taxpayers, and document how this division of responsibility will evolve over the life of the project;
- Include in the Project Development Objectives (PDO) appropriate (one or two) financial performance objectives;
- Ensure that the Results Framework (RF) clearly defines “financial sustainability” and “cost recovery” and includes corresponding monitoring indicators;
- Ensure that Financial Covenants of the Legal Agreement clearly reflect what has been agreed with the Borrower in the RF, including the promised provision of government subsidies;
- For WSS projects, locate the service provider on the Financial Sustainability Ladder and design the project accordingly;
- Ensure that the Economic and Financial Analyses are complete and include past and forecast of income statements, cash flow statements and balance sheets of revenue-earning service providers and a cash flow analysis of nonrevenue-earning projects; and
- Include a Financial Sustainability Annex to the Quality Enhancement Review (QER) Package that confirms that the above has been complied with.
4.2 For the Water Sector Board

- Ensure that the Sector better rewards, recognizes and supports financial analysts and economists;
- Commission key analytical advisory activities (AAA) in this area, identify innovations and leverage technology;
- Work with the Legal Department (LEG) on the updating of a set of standard financial covenants and remedies that are more practical and pragmatic than what is currently available;
- Sharpen core WSS indicators and include at least one indicator that refers to financial sustainability and cost recovery from users; and
- Issue a formal Guidance Note on the design on WSS tariffs and subsidies and organize a structured training on the topic for headquarters and field based staff.

4.3 For the Water Anchor

- Help ensure consistency and thoroughness through mandatory written reviews of most projects under preparation (see Annex 6 for a draft review checklist);
- Work with strategic partners to enhance the Bank’s capacity in areas where it has not traditionally had a comparative advantage (such as marketing of cost recovery policies to stakeholders);
- Report regularly on the progress in achieving financial sustainability for a rolling sample of projects (say 15) as they are implemented; and
- Review the Bank’s financial sustainability strategies once every five years through a paper such as this one.

4.4 On Dissemination

Given the wide dispersion of Bank staff, it is further recommended that this Note be:

- Placed on the Water Sector’s website and introduced through a Bank blog;
- Presented to the Water Sector Board, where staff often connect through Adobe Connect;
- Made into a webinar;
- The basis for a Bank-wide, and if requested regional Unit, brown bag lunch (BBL) presentation;
- Used to help design modules for the Water Orientation Course and formal water sector training courses; and
- An input to the Project “check list” for peer reviewers (Annex 6).

It is also recommended that this report be a background paper for a formal Guidance Note to be issued for Bank staff on financial sustainability and cost recovery in the water sector.
ANNEX 1. ESTIMATING TARIFFS

For Meeting Financial Objectives

Let's assume a WSS utility whose current annual sales (100 million m3/year) are expected to grow at an average 2.5 percent per year. O&M costs are estimated at $0.20/m3. Fixed assets have a historical value of $150 million and are depreciated over a 30 year period. $90 million have been financed by loans that have already been fully repaid and $15 million by a development grant. $45 million have recently been financed by debt (tenor 20 years and interest rate 6 percent) to be repaid until year 15; future debt is expected to be raised on similar terms. The average capital expenditure for distribution and sewerage networks extensions is $5 million per year; a major production project valued at $70 million is expected to be commissioned in year 6. All above figures are given in constant prices for year 0. The average inflation rate is estimated at 3 percent.

The Regulator has been requested to propose a sequence of tariffs that limit future annual increases to 3 percent, i.e., the expected inflation rate.

**Cash Needs.** If the future CAPEX is entirely financed on debt, the tariff needed to cover each year O&M costs and the debt service initially of $0.24/m3 would have to be gradually increased to $0.29/m3 in year 5 and steeply to $0.36/m3 in year 6 (a 25 percent increase). This sequence of tariffs does meet cash needs by does not comply with annual tariff adjustment restrictions. An initial tariff of $0.2775/m3 increased by 3 percent per year during the coming 10 years would cover all cash costs, an initially build a cash reserve that would gradually disappear until year 10.

**Cash Needs with Contribution to CAPEX.** If 25 percent of the upcoming CAPEX is to financed by cash surpluses, the tariff increase needed in year 6 for contributing to the lumpy investment would be almost 80%, although such a high tariff would not be needed after year 6. To limit annual tariff increases, a cash reserve would have to be built before year 6. An initial tariff set at $0.29/m3 gradually increased by 3 percent per year would be sufficient for contributing to the CAPEX; the cash reserve would later be at a minimum level.

**Utility Costs.** If the utility is to cover its O&M costs, depreciate its fixed assets and yield an average 8 percent return on fixed assets, the tariff would have to be set at an initial $0.4225/m3 and gradually increased by 3 percent per year thereafter. But this sequence of tariff would result in a cash reserve of almost $200 million by year 10, or about two thirds of the value of assets. Lowering the initial tariff at $0.3225/m3 would limit the return on assets to 2 percent and the cash surplus to $50 million, while still meeting all cash needs during the 10-year period.

**Hybrid Utility Costs.** The “hybrid” variant would consist in setting revenues to cover O&M costs, the debt service, the depreciation of equity financed assets and a return on equity of 8 percent. An initial tariff of $0.3625/m3 gradually increased by 3 percent per year would meet this objective and limit the cash reserve to about $100 million in year 10. Limiting the return on equity to 2 percent would require an initial tariff of $0.31/m3 and reduce the cash reserve in year 10 at about $30 million.
<table>
<thead>
<tr>
<th>Year</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>million m3</td>
<td>100.0</td>
<td>102.5</td>
<td>105.1</td>
<td>107.7</td>
<td>110.4</td>
<td>113.1</td>
<td>116.0</td>
<td>118.9</td>
<td>121.8</td>
<td>124.9</td>
</tr>
<tr>
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<td>$/m3</td>
<td>20.0</td>
<td>21.1</td>
<td>22.3</td>
<td>23.5</td>
<td>24.8</td>
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<td>5.0</td>
<td>5.2</td>
<td>5.3</td>
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<td>6.1</td>
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<td>160.2</td>
<td>165.5</td>
<td>170.9</td>
<td>176.5</td>
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<td>271.9</td>
<td>278.0</td>
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<td>Debt</td>
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<td>48.8</td>
<td>52.6</td>
<td>56.6</td>
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<td>64.9</td>
<td>69.3</td>
<td>136.4</td>
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<td>Cash Needs (100% Debt Financing)</td>
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<tr>
<td>Needed tariff</td>
<td>$/m3</td>
<td>0.24</td>
<td>0.25</td>
<td>0.26</td>
<td>0.27</td>
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<td>3.7%</td>
<td>3.6%</td>
<td>3.6%</td>
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<td>Cash Needs (25% Cash Contribution)</td>
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<td>$/m3</td>
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<td>$16.7 17.6 18.5 19.5 20.6 21.7 -3.5 18.7 20.0 21.5 23.0</td>
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<th>Cumulative cash buildup</th>
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<tr>
<td>$16.7 34.4 52.9 72.4 93.0 114.7 111.2 129.9 150.0 171.5 194.5</td>
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<td>% 10.8% 11.0% 11.2% 11.4% 11.7% 11.9% -1.3% 6.7% 7.0% 7.4% 7.7% 8.0%</td>
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<th>Hybrid Utility Costs</th>
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<td>$/m3</td>
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<tr>
<td>% 0.0% 1.9% 1.9% 1.9% 1.9% 18.9% 1.3% 1.4% 1.4% 1.4%</td>
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For Meeting Economic Objectives

An estimate of the average incremental cost (AIC) of water as a proxy for the long run marginal cost has been carried out for a discount rate of 8 percent over a 25 year period. For sales forecast to increase by 2.5 percent per year for the next 25 years, major capacity expansions valued at $120 million in year 14 and $200 million in year 22 are scheduled in addition to that of $70 million in year 6; regular extensions of networks is valued at $5 million/year. The NPV of incremental OPEX is estimated at $58 million, and the NPV of the CAPEX at 175 million out of which the discounted residual value of assets of $52 million have to be deducted. For a NPV of sales of 292 million m$^3$, the AIC would be $0.62/m$^3$

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<th>22</th>
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<td>0.63</td>
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<td>0.18</td>
<td>0.16</td>
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<tr>
<td>Sales</td>
<td>2.5% million m$^3$</td>
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<td>102.5</td>
<td>105.1</td>
<td>107.7</td>
<td>110.4</td>
<td>113.1</td>
<td>116.0</td>
<td>141.3</td>
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<tr>
<td>Discounted</td>
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<td>2.3</td>
<td>4.3</td>
<td>6.1</td>
<td>7.6</td>
<td>8.9</td>
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<td>Incremental Opex</td>
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<td>1.5</td>
<td>2.1</td>
<td>2.6</td>
<td>3.2</td>
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<tr>
<td>Discounted</td>
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<td>0.9</td>
<td>1.2</td>
<td>1.5</td>
<td>1.8</td>
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<td>2.6</td>
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<tr>
<td>Incremental Capex</td>
<td>$ million</td>
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<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
<td>75.0</td>
<td>125.0</td>
<td>205.0</td>
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<tr>
<td>Discounted</td>
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<td>4.6</td>
<td>4.3</td>
<td>4.0</td>
<td>3.7</td>
<td>3.4</td>
<td>47.3</td>
<td>42.6</td>
<td>37.7</td>
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<tr>
<td>Residual Value</td>
<td>$ million</td>
<td>1.0</td>
<td>1.2</td>
<td>1.3</td>
<td>1.5</td>
<td>1.7</td>
<td>27.5</td>
<td>79.2</td>
<td>184.5</td>
<td>4.8</td>
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<tr>
<td>Discounted</td>
<td>$ million</td>
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<td>52.1</td>
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AIC 0.62
ANNEX 2: EXAMPLE OF CASH CONTRIBUTION COVENANT

Indonesia – Second Jabotabek Urban Development Project

LOAN NUMBER 3219 IND
(Second Jabotabek Urban Development Project)
between
REPUBLIC OF INDONESIA
and
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

Dated July 6, 1990
LOAN AGREEMENT

AGREEMENT, dated July 6, 1990, between
REPUBLIC OF INDONESIA (the Borrower)
and INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT (the Bank).

…

(D) part of the Project will be carried out by Daerah Khusus Ibukota Jakarta (DKI Jakarta) with the Borrower's assistance and, as part of such assistance, the Borrower will make available to DKI Jakarta part of the proceeds of the Loan as provided in this Agreement,\(^{37}\)

(E) part of the Project will be carried out by Perusahaan Daerah Air Minum Jaya (PDAM Jaya) with the Borrower's assistance and, as part of such assistance, the Borrower will make available to PDAM Jaya part of the proceeds of the Loan as provided in this Agreement,\(^{38}\) and

(F) part of the Project will be carried out by Perusahaan Daerah Air Minum Tangerang (PDAM Tangerang) with the Borrower's assistance and, as part of such assistance, the Borrower will make available to PDAM Tangerang part of the proceeds of the Loan as provided in this Agreement.\(^{39}\)

…

\(^{37}\) DKI Jakarta: Jakarta Local Government.
\(^{38}\) PDAM Jaya: Jakarta Water Utility.
\(^{39}\) PDAM Tangerang: Tangerang Water Utility.
ARTICLE IV
Financial Covenants

Section 4.01.

(a) The Borrower shall maintain or cause to be maintained records and accounts adequate to reflect in accordance with sound accounting practices the operations, resources and expenditures in respect of the Project of the departments or agencies of the Borrower responsible for carrying out the Project or any part thereof.

(b) The Borrower shall:

(i) have the records and accounts referred to in paragraph (a) of this Section, including those for the Special Account, for each fiscal year audited, in accordance with appropriate auditing principles consistently applied, by independent auditors acceptable to the Bank; and

(ii) furnish to the Bank as soon as available, but in any case not later than (nine) 9 months after the end of each such year, the report of such audit by said auditors, of such scope and in such detail as the Bank shall have reasonably requested.

(c) For all expenditures with respect to which withdrawals from the Loan Account for the Project were made on the basis of statements of expenditure, the Borrower shall:

(i) maintain or cause to be maintained, in accordance with paragraph (a) of this Section, records and accounts reflecting such expenditures;

(ii) retain, until at least one year after the Bank has received the audit report for the fiscal year in which the last withdrawal from the Loan Account or payment out of the Special Account was made, all records (contracts, orders, invoices, bills, receipts and other documents) evidencing such expenditures;

(iii) enable the Bank's representatives to examine such records; and

(iv) ensure that such records and accounts are included in the annual audit referred to in paragraph (b) of this Section and that the report of such audit contains a separate opinion by said auditors as to whether the statements of expenditure submitted during such fiscal year, together with the procedures and internal controls involved in their preparation, can be relied upon to support the related withdrawals.

Section 4.02. The Borrower shall cause: (a)

(i) PDAM Jaya to maintain records and accounts adequate to reflect in accordance with sound accounting practices the operations and financial condition of PDAM Jaya;

(ii) PDAM Tangerang to maintain records and accounts adequate to reflect in accordance with sound accounting practices the operations and financial condition of PDAM Tangerang; and
(iii) BPAL/PDAL to maintain records and accounts adequate to reflect in accordance with sound accounting practices the operations and financial condition of BPAL/PDAL.  

(b) PDAM Jaya, PDAM Tangerang and BPAL/PDAL each to:

(i) have the records and accounts referred to in paragraph (a) of this Section for each fiscal year audited, in accordance with appropriate auditing principles consistently applied, by independent auditors acceptable to the Bank;

(ii) furnish to the Bank as soon as available, but in any case not later than (nine) 9 months after the end of each such year, the report of such audit by said auditors, of such scope and in such detail as the Bank shall have reasonably requested; provided however, that the audits for the calendar years ending 1989 and 1990 shall be made available not later than (fifteen) 15 months after the end of each such year, and that the audit for calendar year 1991 shall be made available not later than (twelve) 12 months after the end of such year; and

(iii) furnish to the Bank such other information concerning said records and accounts and the audit thereof as the Bank shall from time to time reasonably request, including a report by JUPCO within three months of the completion of any audit, of the actions taken to carry out the recommendations, if any, by the auditors.

Section 4.03. By April 1, 1991, and thereafter by January 1 in each third year, the Borrower shall cause DKI Jakarta together with PDAM Jaya:

(a) to adjust its tariffs, on the basis of realistic forecasts, after reviewing the adequacy of the tariffs of PDAM Jaya to meet the requirements set forth in Sections 4.04 and 4.05 of this Agreement for the next three fiscal years; and

(b) to furnish to the Bank the results of such review upon completion.

Section 4.04. Except as the Bank shall otherwise agree, the Borrower shall ensure that:

(a) PDAM Jaya shall not incur any debt unless a reasonable forecast of the revenues and expenditures of PDAM Jaya shows that the projected net revenues of PDAM Jaya for each fiscal year during the term of the debt to be incurred shall be at least 1.5 times the projected debt service requirement of PDAM Jaya in such year on all debt of PDAM Jaya including the debt to be incurred; and

(b) PDAM Jaya's debt shall be no more than 70% of its total capitalization. For the purposes of this Section:

(i) the term "debt" means any indebtedness of PDAM Jaya maturing by its terms more than one year after the date on which it is originally incurred;

(ii) debt shall be deemed to be incurred: (A) under a loan contract or agreement or other instrument providing for such debt or further modification of its terms of payment, on the

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40 PDPAL Jaya: Jakarta semi-autonomous Wastewater Department
date of such contract, agreement or instrument; and (B) under a guarantee agreement, on the date the agreement providing for such guarantee has been entered into;

(iii) the term "net revenues of PDAM Jaya" means gross revenues of PDAM Jaya from all sources, adjusted to take account of PDAM Jaya's tariffs in effect at the time of the incurrence of debt even though they were not in effect during the twelve-month period to which such revenues relate, less all operating expenses of PDAM Jaya, including expenses accountable to administration, maintenance and taxes (or payments in lieu of taxes), but before provision for depreciation of assets and interest and other charges on debt;

(iv) the term "debt service requirement" means the aggregate amount of repayments (including sinking fund payments, if any) of, and interest and other charges on, debt;

(v) the term "reasonable forecast" means a forecast prepared by PDAM Jaya in the fiscal year in which the debt in question is to be incurred, which both the Bank and PDAM Jaya accept as reasonable and as to which the Bank has notified PDAM Jaya of its acceptability, provided that no event has occurred since such notification which has, or may reasonably be expected in the future to have, a material adverse effect on the financial condition or future operating results of PDAM Jaya;

(vi) the term "total capitalization" means debt plus equity;

(vii) the term "equity" means the sum of the total unimpaired paid-up capital, retained earnings and reserves of PDAM Jaya not allocated to cover specific liabilities; and

(viii) whenever for the purposes of this Section it shall be necessary to value, in terms of currency of the Borrower, debt payable in another currency, such valuation shall be made on the basis of the prevailing lawful rate of exchange at which such other currency is, at the time of such valuation, obtainable for the purposes of servicing such debt, or, with absence of such rate on the basis of a rate of exchange acceptable to the Bank.

Section 4.05.

(a) Except as the Bank shall otherwise agree, for investment purposes the Borrower shall cause:

(i) PDAM Jaya to produce funds from internal sources, for each of its fiscal years commencing on its fiscal year January 1, 1990, equivalent to not less than thirty percent (30%) of the annual average of its expenditures incurred, or expected to be incurred, for that year, the previous fiscal year and the next fiscal year; and

(ii) DKI to provide new equity to PDAM Jaya which will be approximately equal to 10% of the total of its capital expenditures during the period 1990-1996.

(b) For the purposes of this Section:

(i) the term "funds from internal sources" means the difference between:
(A) the sum of revenues from all sources related to operations, consumer deposits and consumer contributions in aid of construction, new non-operating income and any reduction in working capital other than cash; and

(B) the sum of all expenses related to operations, including administration, adequate maintenance and taxes and payments in lieu of taxes (excluding provision for depreciation and other non-cash operating charges), debt service requirements, all cash dividends and other cash distributions of surplus, increase in working capital other than cash and other cash outflows other than capital expenditures;

(ii) the term "net non-operating income" means the difference between:

(A) revenues from all sources other than those related to operations; and

(B) expenses, including taxes and payments in lieu of taxes, incurred in the generation of revenues in (A) above;

(iii) the term "working capital other than cash" means the difference between current assets excluding cash and current liabilities at the end of each fiscal year;

(iv) the term "current assets excluding cash" means all assets other than cash which could in the ordinary course of business be converted into cash within twelve months, including accounts receivable, marketable securities, inventories and pre-paid expenses properly chargeable to operating expenses within the next fiscal year;

(v) the term "current liabilities" means all liabilities which will become due and payable or could under circumstances then existing be called for payment within twelve months, including accounts payable, customer advances, debt service requirements, taxes and payments in lieu of taxes, and dividends;

(vi) the term "debt service requirements" means the aggregate amount of repayments (including sinking fund payments, if any) of, and interest and other charges on, debt;

(vii) the term "capital expenditures" means expenditures incurred on account of fixed assets, related to operations, including interest charged to construction of those assets, but excluding the expenditures incurred for the construction of, and interest and commitment charges accrued during construction of the Buaran II Water Treatment Plant to be located in Jakarta; and

(viii) whenever for the purposes of this Section it shall be necessary to value, in terms of the currency of the Borrower, debt payable in another currency, such valuation shall be made on the basis of the prevailing lawful rate of exchange at which such other currency is, at the time of such valuation, obtainable for the purposes of servicing such debt, or, in the absence of such rate, on the basis of a rate of exchange acceptable to the Bank.

Section 4.06. By January 1, 1993, and thereafter by January 1 in each third year, the Borrower shall cause the local government of Tangerang together with PDAM Tangerang:
(a) to adjust its tariffs, on the basis of realistic forecasts, after reviewing the adequacy of the tariffs of PDAM Tangerang to meet the requirements set forth in Sections 4.07 and 4.08 of this Agreement for the next three fiscal years; and  

(b) to furnish to the Bank such review upon its completion.

Section 4.07. Except as the Bank shall otherwise agree, the Borrower shall ensure that:

(a) PDAM Tangerang shall not incur any debt unless a reasonable forecast of the revenues and expenditures of PDAM Tangerang shows that the projected net revenues of PDAM Tangerang for each fiscal year during the term of the debt to be incurred shall be at least 1.5 times the projected debt service requirement of PDAM Tangerang in such year on all debt of PDAM Tangerang including the debt to be incurred; and  

(b) PDAM Tangerang's debt shall be no more than 70% of its total capitalization. For the purposes of this Section the terms and phrases have the same meanings, mutatis mutandis, as in Section 4.04 of this Agreement.

Section 4.08.

(a) Except as the Bank shall otherwise agree, the Borrower shall cause PDAM Tangerang to produce, for investment purposes, funds from internal sources, for each of its fiscal years commencing on its fiscal year January 1, 1990, equivalent to not less than thirty percent (30%) of the annual average of its total capital expenditures, incurred, for that year, the previous fiscal year and the next fiscal year.  

(b) For the purposes of this Section the terms and phrases have the same meanings, mutatis mutandis, as in Section 4.05 (b) of this Agreement, provided, however, that the term "capital expenditures" means expenditures incurred on account of fixed assets related to operations, including interest charged during construction of those assets, but excluding the expenditures incurred for the construction of, and interest and commitment charges accrued during construction of the Cisadane Water Treatment Plant to be located in Tangerang.

Section 4.09. With respect to Part B of the Project, the Borrower shall charge tariffs for raw water, in accordance with terms satisfactory to the Bank, beginning with the completion of the first pipeline (estimated to be in calendar 1991); and there-after shall review and adjust, if necessary, such tariff every three years until full cost recovery is achieved. For the purpose of this Section, the term “full cost recovery” has the same meaning as provided for in the “Agreement on Provision and Utilization of Raw Water for Drinking Water Delivered from the West Tarum Canal,” entered into between the POJ and the PDAM Jaya dated March 28, 1985.

Section 4.10. The Borrower shall cause DKI Jakarta, by April 1, 1993, and by April 1 every three years thereafter, to review the ground water abstraction fee and adjust such fee, based on the relevant results of the groundwater study which is expected to be completed by September 30, 1992, which groundwater study is part of the overall Jabotabek Water Resources Management Study.
Section 4.11. The Borrower shall provide all the financing for the Buaran II Treatment Plant in DKI Jakarta and for the Cisadane Treatment Plant in Tangerang, and shall modify all of its existing agreements with PDAM Jaya and PDAM Tangerang to extend the existing grace period to December 31, 2000, to provide for the accumulation of interest and commitment fee during the grace period, and to review the financial position of each PDAM Jaya and PDAM Tangerang in the year 2000 in order to determine their capability of paying the respective accumulated interest.

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ANNEX 3  EXAMPLE OF RATE OF RETURN COVENANT

Korea – Pusan and Taejon Sewerage Project

LOAN NUMBER 3450 KO
(Pusan and Taejon Sewerage Project)
between
INTERNATIONAL BANK FOR RECONSTRUCTION
AND DEVELOPMENT
and
PUSAN CITY GOVERNMENT
Dated May 21, 1992
PUSAN PROJECT AGREEMENT
AGREEMENT, dated May 21, 1992, between
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT (the Bank)
And
PUSAN CITY GOVERNMENT (Pusan).

ARTICLE III

Financial Covenants

Section 3.01.

(a) Pusan shall maintain or cause to be maintained records and accounts adequate to reflect in accordance with sound accounting practices the operations, resources and expenditures in respect of Part A of the Project and of the departments or agencies of Pusan responsible for carrying out Part A of the Project or any part thereof.

(b) Pusan shall:

(i) have the records and accounts referred to in paragraph (a) of this Section for each fiscal year audited, in accordance with appropriate auditing principles consistently applied, by independent auditors acceptable to the Bank;

(ii) furnish to the Bank as soon as available, but in any case not later than six months after the end of each such year, the report of such audit by said auditors, of such scope and in such detail as the Bank shall have reasonably requested; and furnish to the Bank such other information concerning said records and accounts and the audit thereof as the Bank shall from time to time reasonably request.

Section 3.02.

(a) Except as the Bank shall otherwise agree, Pusan shall take all steps necessary to establish, maintain and collect sewerage charges at such levels so as to produce revenues, for each fiscal year commencing in the fiscal year 1993:
(i) covering, with respect to sewerage activities, operation and maintenance costs, including depreciation, and debt service payments in excess of depreciation;

(ii) yielding an annual return of not less than 5% of the average current net value of Pusan's fixed sewerage assets in operation; and

(b) For the purposes of this Section:

(i) The annual return shall be calculated by dividing Pusan's net operating income from sewerage activities for the fiscal year in question by one half of the sum of the current net value of Pusan's fixed sewerage assets in operation at the beginning and at the end of that fiscal year.

(ii) The term "net operating income" means total operating revenues less total operating expenses.

(iii) The term "total operating revenues" means revenues from all sources related to operations.

(iv) The term "total operating expenses" means all expenses related to sewerage operations, including administration, adequate maintenance, taxes and payments in lieu of taxes, and provision for depreciation on a straight-line basis at a rate of not less than 2.6% per annum of the average current gross value of Pusan's fixed sewerage assets in operation, or other basis acceptable to the Bank, but excluding interest and other charges on debt.

(v) The average current gross value of Pusan's fixed sewerage assets in operation shall be calculated as one half of the sum of the gross value of Pusan's fixed sewerage assets in operation at the beginning and at the end of the fiscal year, as valued from time to time in accordance with sound and consistently maintained methods of valuation satisfactory to the Bank.

(vi) The term "current net value of Pusan's fixed sewerage assets in operation" means the gross value of Pusan's fixed sewerage assets in operation less the amount of accumulated depreciation, as valued from time to time in accordance with sound and consistently maintained methods of valuation satisfactory to the Bank.

Section 3.03. Pusan shall revalue from time to time its fixed sewerage assets on the basis required by the relevant laws of the Borrower.

.....
Annex 4 rapidly analyzes how financial sustainability of WSS service providers and cost recovery of WSS projects are addressed in a sample of 12 urban and four rural WSS projects approved since the beginning of 2010 (Table 4.1). The analysis reviews the content of: (i) Project Development Objectives (PDOs); (ii) financial covenants; (iii) Results Frameworks (RFs); (iii) Operational Risks Assessment Frameworks (ORAFs); and (iv) the financial and economic analyses included in their PADs.

### Table 4.1. Water Supply and Sanitation Projects Reviewed

<table>
<thead>
<tr>
<th>Country</th>
<th>Project Reviewed</th>
<th>WSS Content</th>
<th>Urban</th>
<th>Rural</th>
<th>Bank Financing US$ mio</th>
<th>Date Approved</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Africa (22 WSS projects approved)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angola</td>
<td>P124511 Water Sector Institutional Dev. (AF)</td>
<td>100%</td>
<td>X</td>
<td></td>
<td>120</td>
<td>06/30/11</td>
</tr>
<tr>
<td>Ghana</td>
<td>P129544 Urban Water (AF)</td>
<td>85%</td>
<td>X</td>
<td></td>
<td>50</td>
<td>03/27/12</td>
</tr>
<tr>
<td>Malawi</td>
<td>P124486 Second National Water Development</td>
<td>91%</td>
<td>X</td>
<td></td>
<td>120</td>
<td>06/02/11</td>
</tr>
<tr>
<td>Niger</td>
<td>P117365 Urban WSS</td>
<td>100%</td>
<td>X</td>
<td></td>
<td>90</td>
<td>04/26/11</td>
</tr>
<tr>
<td><strong>Middle East North Africa (5 WSS projects approved)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lebanon</td>
<td>P103063 Greater Beirut WS</td>
<td>100%</td>
<td>X</td>
<td></td>
<td>200</td>
<td>12/16/10</td>
</tr>
<tr>
<td>Morocco</td>
<td>P100397 Regional WS Systems</td>
<td>100%</td>
<td>X</td>
<td></td>
<td>175</td>
<td>06/15/10</td>
</tr>
<tr>
<td><strong>Europe and Central Asia (2 WSS projects approved)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Armenia</td>
<td>P126722 Municipal Water</td>
<td>80%</td>
<td>X</td>
<td></td>
<td>15</td>
<td>02/21/12</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>P118196 Second Dushanbe WS</td>
<td>100%</td>
<td>X</td>
<td></td>
<td>16</td>
<td>06/07/11</td>
</tr>
</tbody>
</table>
# Urban Water Supply and Sanitation Projects

Table 4.2 below summarizes the coverage of financial sustainability and cost recovery in the 12 urban WSS projects reviewed.

## Project Development Objectives

Urban WSS projects typically aim at achieving “universal access” to the WSS infrastructure and the “reliability”, “efficiency”, “financial sustainability”, “environmental sustainability” and the “affordability” of the WSS service. These key words are usually found in PDOs, but none of the PDOs reviewed list them all. Also, these concepts are not always clarified in PADs and/or RFs.

## Results Frameworks

Although the financial sustainability objective pursued by the project is not always clearly formulated in RFs, most urban WSS projects reviewed aimed at recovering O&M costs and at servicing the debt of the WSS service provider, i.e., at recovering its “cash needs” as defined above.  

- The exact definition of indicators used for monitoring progress towards this objective varies from project to project. For example, the term “Working Ratio”, could depending upon the project be the ratio of cash operating expenses to: (i) operating revenues (billing); (ii) operating and non-operating revenues (billing plus operating subsidies); or (iii) collected bills. For WSS service providers that often struggle collecting bills from either private or public customers, the latter indicator is probably the most meaningful monitoring indicator.

---

41 None of the urban WSS projects reviewed aimed at recovering “utility costs” as defined above.
- PADs sometimes use terminologies that need to be clarified: if the concept of “financial equilibrium” of the public WSS utility company of Niger is accurately defined as being the “previous year net cash flow from operations minus debt service and variation of working capital requirements being positive or equal to zero”, that of “profitability” of utilities participating in the Angola WSS project would benefit from a clearer definition.
- While most WSS projects aim at servicing the debt from collected user fees, only a few discuss conditions under which IDA Credits or IBRD Loans are to be on-lent to beneficiary WSS service providers.
- Finally, none of the RFs reviewed set targets for: (i) phasing out operating subsidies, if still provided by governments; and for (ii) contributing cash generated from operations to the CAPEX.

Financial Covenants. Seven out of the 12 urban WSS projects reviewed do not list a financial covenant in their Project Data Sheet (PDS). Also, while ten RFs out of 12 clearly aim at recovering O&M costs from collected user fees only five PDs list a specific Working Ratio covenant. A few projects include financial covenants tailored to the issues to be addressed under the project, such as:
- The minimum debt service coverage ratio to be achieved (Tajikistan);
- Operating subsidies to be provided to complement collected bills (Vietnam); or
- The cash position to be achieved by the implementing WSS utility (Niger).

Teams who appraise urban WSS project, and managers who approve them, may have doubts about the effectiveness and enforceability of financial covenants. But by not recording agreements on the financial performance to be achieved, the risk that the latter is not monitored thoroughly during project supervision increases, even when audited financial statements provide sufficient data for carrying out a meaningful analysis of the progress made towards financial sustainability.

Table 4.2. Coverage of Financial Sustainability and Cost Recovery Issues in PADs of Urban WSS

<table>
<thead>
<tr>
<th>Country</th>
<th>Financial Covenants</th>
<th>Results Framework</th>
<th>ORAF</th>
<th>Economic and Financial Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Indicators to be monitored</td>
<td>Financial Risk identified</td>
<td>Financial Forecast of WSS Utility(ies)</td>
</tr>
<tr>
<td>Angola</td>
<td>No financial covenant</td>
<td>“Profitability” of WSS utilities</td>
<td>Yes</td>
<td>Simplified cash flow analysis</td>
</tr>
<tr>
<td>Ghana</td>
<td>No financial covenant</td>
<td>Recovery of cash needs (O&amp;M) from collection</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Malawi</td>
<td>Working ratio; Payment of gov. bills</td>
<td>Working Ratio</td>
<td>No</td>
<td>Simplified income statements</td>
</tr>
<tr>
<td>Niger</td>
<td>Restoration of utility</td>
<td>Net cash from operations minus debt and variation of</td>
<td>Yes</td>
<td>Full analysis in</td>
</tr>
<tr>
<td>Country</td>
<td>Financial Covenant</td>
<td>Financial Indicator</td>
<td>Working Capital</td>
<td>ORAF</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------</td>
<td>---------------------</td>
<td>----------------</td>
<td>------</td>
</tr>
<tr>
<td>Lebanon</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Simplified cash accounting</td>
</tr>
<tr>
<td>Armenia</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>Debt service covenant; Working ratio covenant</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>China</td>
<td>Working ratio</td>
<td>No reference to cost recovery</td>
<td>No ORAF</td>
<td>No; Yes</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Working ratio; Debt service sharing; Operating subsidies</td>
<td>Working ratio</td>
<td>Tariff adjustment</td>
<td>Yes</td>
</tr>
<tr>
<td>Brazil</td>
<td>No financial covenant</td>
<td>EBTIDA margin</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Mexico</td>
<td>No financial covenant</td>
<td>No financial indicator</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Panama</td>
<td>No financial covenant</td>
<td>US$/capita collected</td>
<td>No ORAF</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Operational Risk Assessment Frameworks.** If two PADs out of 12 do not include an ORAF, five do not mention not recovering cash needs from collected user fees as a risk to be mitigated. Four out of the five that do so do not propose convincing a mitigation arrangement for addressing this risk.

- If delays in tariff adjustments are usually identified, other variable of the income equation, such as: (i) lower than expected sales, as a result of tariff increases or enforcement of collection procedures; or (ii) higher O&M costs because of lower than expected efficiency gains on for example NRW or bill collection as a result of inadequate incentives are seldom mentioned.
- Also, because only a few PADs describe on-lending of Bank financing by the Government, the foreign exchange risk is rarely discussed clearly.

The Niger WSS project however seems to be taking the risk of non-complying with the “financial equilibrium” covenant seriously by making it a condition for suspending disbursement.

**Financial and Economic Analyses.** If safeguards (environment and social) and fiduciary (procurement and financial management) requirements are covered in great detail by accredited staff along imposed formats, the coverage of financial sustainability of the implementing entities, recovery of costs associated with the project and affordability of user fees varies widely, even
when projects have identical PDOs and support similar institutional arrangements. The financial analysis of an urban WSS project should provide clear answers to the following three questions:

- **Who is the Bank lending to**, and thus provide a summary of past audited financial statements and a summary of future financial statements, including a list of assumptions made. This summary should also include a discussion of the evolution of key profitability, liquidity and leverage ratios for documenting the financial sustainability of the recipient. OMS 2.20 specifies the content of the financial analysis to be carried out for a WSS project implemented by a corporate entity, but this requirement is interpreted differently. For example:
  i. The Panama PAD includes a very detailed analysis of the loss making public WSS beneficiary of the Bank Loan, but does not propose a financial recovery plan.
  ii. The Niger PAD summarizes the conclusions of a detailed analysis (available in project files) of the public WSS utility and of the plan for achieving agreed financial objectives, including tariff adjustments, on-lending of IDA Credit and the arrangements put in place for collecting water bills from government agencies, a category of customer whose behavior could badly affect the cash flows of the WSS service provider.
  iii. The Brazil-Serguipe PAD includes a summary of key financial ratios of the utility implementing the WSS component of the project; the Vietnam and Tajikistan projects discuss the conclusions of analyses reported to be available in project files.
  iv. The Angola, Malawi, and Lebanon PADs provide summaries of simplified income statements.
  v. The Ghana and Armenia PADs do not discuss the past and future financial performance of WSS utilities to which the Bank had earlier extended financing, and thus whose audited financial statements are available.
  vi. The PAD of the Mexico project, aimed at improving efficiency of participating WSS utilities, does not discuss the financial performance to be achieved.
  vii. The China-Sichuan PAD includes a fiscal analysis, as its WSS component is not implemented by a corporate entity.

- **What is the Bank lending for**, and justify the proposed project on the basis of an analysis of the Net Present Value (NPV) and Economic Rate of Return (ERR) of the project economic benefits net of costs and an analysis of the NPV and Financial Internal Rate of Return of incremental cash flows resulting from the project. PADs usually comply with this requirement; only the Ghana Project Paper for the extension of an existing project, does not include a summary of such estimates.

- **Can the Bank extend financing to the WSS Utility(ies)** and support a positive answer with arguments that combine judgments on:
  i. The good financial standing of the beneficiary WSS service provider(s) or, if applicable, the credibility of the time-bound plan proposed for achieving financial sustainability defined the ability to recover cash needs from collected user fees.
  ii. The robustness of the economic and financial justifications of the proposed project.
  iii. The arrangements put in place for monitoring and enforcing compliance with agreed financial performance.
<table>
<thead>
<tr>
<th>Country</th>
<th>Financial Covenants</th>
<th>Results Framework</th>
<th>ORAF</th>
<th>Economic and Financial Analysis</th>
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<td></td>
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<td>No</td>
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<td>Malawi</td>
<td>Working ratio;</td>
<td>Working Ratio</td>
<td>No</td>
<td>Simplified income statements</td>
</tr>
<tr>
<td></td>
<td>Payment of gov. bills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niger</td>
<td>Restoration of utility “financial equilibrium”</td>
<td>Net cash from operations minus debt and variation of Working Capital</td>
<td>Yes</td>
<td>Full analysis in project files</td>
</tr>
<tr>
<td>Lebanon</td>
<td>No financial covenant</td>
<td>No financial indicator</td>
<td>No</td>
<td>Simplified cash accounting</td>
</tr>
<tr>
<td>Armenia</td>
<td>No financial covenant</td>
<td>No financial indicator</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>Debt service covenant; Working ratio covenant</td>
<td>Working ratio; Billing volume; Accounts receivable</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>China</td>
<td>Working ratio</td>
<td>No reference to cost recovery</td>
<td>No ORAF</td>
<td>No; Fiscal analysis</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Working ratio;</td>
<td>Working ratio</td>
<td>Tariff adjustment</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Debt service sharing; Operating subsidies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>No financial covenant</td>
<td>EBTIDA margin</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Mexico</td>
<td>No financial covenant</td>
<td>No financial indicator</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Operational Risk Assessment Frameworks. If two PADs out of 12 do not include an ORAF, five do not mention not recovering cash needs from collected user fees as a risk to be mitigated. Four out of the five that do so do not propose convincing a mitigation arrangement for addressing this risk.

- If delays in tariff adjustments are usually identified, other variable of the income equation, such as: (i) lower than expected sales, as a result of tariff increases or enforcement of collection procedures; or (ii) higher O&M costs because of lower than expected efficiency gains on for example NRW or bill collection as a result of inadequate incentives are seldom mentioned.
- Also, because only a few PADs describe on-lending of Bank financing by the Government, the foreign exchange risk is rarely discussed clearly.

The Niger WSS project however seems to be taking the risk of non-complying with the “financial equilibrium” covenant seriously by making it a condition for suspending disbursement.

Financial and Economic Analyses. If safeguards (environment and social) and fiduciary (procurement and financial management) requirements are covered in great detail by accredited staff along imposed formats, the coverage of financial sustainability of the implementing entities, recovery of costs associated with the project and affordability of user fees varies widely, even when projects have identical PDOs and support similar institutional arrangements. The financial analysis of an urban WSS project should provide clear answers to the following three questions:

**Who is the Bank lending to**, and thus provide a summary of past audited financial statements and a summary of future financial statements, including a list of assumptions made. This summary should also include a discussion of the evolution of key profitability, liquidity and leverage ratios for documenting the financial sustainability of the recipient. OMS 2.20 specifies the content of the financial analysis to be carried out for a WSS project implemented by a corporate entity, but this requirement is interpreted differently. For example:

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- The Niger PAD summarizes the conclusions of a detailed analysis (available in project files) of the public WSS utility and of the plan for achieving agreed financial objectives, including tariff adjustments, on-lending of IDA Credit and the arrangements put in place for collecting water bills from government agencies, a category of customer whose behavior could badly affect the cash flows of the WSS service provider.
- The Brazil-Serguipe PAD includes a summary of key financial ratios of the utility implementing the WSS component of the project; the Vietnam and Tajikistan projects discuss the conclusions of analyses reported to be available in project files.
- The Angola, Malawi, and Lebanon PADs provide summaries of simplified income statements.
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The PAD of the Mexico project, aimed at improving efficiency of participating WSS utilities, does not discuss the financial performance to be achieved.

The China-Sichuan PAD includes a fiscal analysis, as its WSS component is not implemented by a corporate entity.

*What is the Bank lending for*, and justify the proposed project on the basis of an analysis of the Net Present Value (NPV) and Economic Rate of Return (ERR) of the project economic benefits net of costs and an analysis of the NPV and Financial Internal Rate of Return of incremental cash flows resulting from the project. PADs usually comply with this requirement; only the Ghana Project Paper for the extension of an existing project, does not include a summary of such estimates.

*Can the Bank extend financing to the WSS Utility(ies)* and support a positive answer with arguments that combine judgments on:
  i. The good financial standing of the beneficiary WSS service provider(s) or, if applicable, the credibility of the time-bound plan proposed for achieving financial sustainability defined the ability to recover cash needs from collected user fees.
  ii. The robustness of the economic and financial justifications of the proposed project.
  iii. The arrangements put in place for monitoring and enforcing compliance with agreed financial performance.

**Rural Water Supply and Sanitation Projects**

Table 4.3 below summarizes the coverage of financial sustainability and cost recovery in the four rural WSS projects reviewed.

<table>
<thead>
<tr>
<th>Country</th>
<th>Financial Covenants</th>
<th>Results Framework</th>
<th>ORAF</th>
<th>Economic and Financial Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Indicators to be monitored</td>
</tr>
<tr>
<td>Morocco</td>
<td>Debt service coverage</td>
<td>Front end fee paid by rural communities</td>
<td>No ORAF</td>
<td>Yes</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>No financial covenant</td>
<td>No financial indicators</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>India-Kerala</td>
<td>Capital cost sharing; O&amp;M costs recovered from communities</td>
<td>“Sustainability” index</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Peru</td>
<td>No financial covenant</td>
<td>Record of payment by users; Working ratio of operations; Billing based on metering</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
**Project Development Objectives.** As for urban WSS projects, PDOs list increased access to WSS infrastructure and improved reliability, efficiency, sustainability and affordability of the WSS service, but never all of them.

**Results Frameworks.** Because of the diversity of technical solutions, ranging for example from piped water systems serving residential connections to point water supply systems, and implementing agencies, ranging from national WSS utility companies to small private promoters of communities, one cannot expect uniformity in the presentation of the RFs for rural WSS projects. As shown in Table 3, indicators to be monitored include: (i) upfront contributions by communities (Morocco, Peru); (ii) recovery of cash O&M expenses from collected user fees (Peru); billing on the basis of metered consumption (Peru); or (iv) a “sustainability index” combining an assessment of the water source reliability, performance of the installations built and institutional arrangements put in place as well as the recovery of O&M costs from beneficiary communities (India-Kerala).

**Financial Covenants.** The Bangladesh and Peru projects do not include financial covenants in their PDSs. The Morocco project includes a debt service coverage ratio for the utility company implementing the project that acts at the same time as bulk water supplier for large cities, water distributor in many secondary cities and as promoter of the rural water supply program and to which the Bank has extended several loans since the 1970s. The India-Kerala project requests cost sharing arrangement for capital costs and full O&M costs recovery from users.

**Operational Risks Assessment Frameworks.** Only the Bangladesh project identifies the financial risks associated with the design of a project that relies heavily upon the capacity of local private developers to meet the demand for piped water in areas affected by the high arsenic content of shallow aquifers, contribute 30 percent of the capital costs (the remaining 70 percent being financed by the IDA Credit) and recover their “hybrid utility costs”, i.e., O&M costs plus depreciation of equity financed assets and return on equity invested and debt service for borrowed funds.

**Economic and Financial Analyses.** The Morocco project is supported by a state-of-the-art economic and financial analysis that includes a review of the past and future financial performance of the implementing agency and of its capacity to service the additional debt attached to the project, and well documented estimates of the NPVs, ERR and FIRR. Interestingly, if the financial analysis concludes that the project is likely to generate financial losses, it could be fully justified on the basis of its economic benefits and the capacity of the Borrower to service the related debt. The Bangladesh project includes simplified pro forma financial statements of private developers of piped rural schemes and a detailed economic justification on the basis of public health benefits. The PAD of the India-Kerala project focuses mostly on economic justification. The Peru project is justified on the basis of a cost benefit analysis.
Angola -- Water Sector Institutional Development Project

Water Supply: 100%

IDA Credit: US$120 million (Additional Financing)

Project Development Objectives

- To strengthen the institutional capacity and efficiency of the Borrower’s agencies in the water sector to improve access to water service delivery.

Financial Covenants

- None.

Results Framework and Monitoring

- Target of two thirds of Provincial WS utilities (PWSU) achieving “profitability” to be monitored;
- Target of two thirds of financial and performance audits reporting positive results to be monitored;
- Revision of tariff policy objective dropped in the additional project.

Operational Risk Assessment Framework

- Inability of PWSU to control expenses and collect tariffs to be mitigated by communication program, TA for improving commercial operations and financing of part of maintenance costs by project.

Economic and Financial Analysis

- Detailed cash flow analysis per PWSU aimed at estimating the amount of subsidy needed taking into account evolution of customer base, losses, collection ratio, and evolution of a politically acceptable tariff.

Comment

- Objective is simply to recover cash O&M costs from cash collection.
Ghana -- Urban Water Project

Water supply (85%); Central Government Administration (15%)

IDA Grant: US$50 million (Additional Financing)

Project Development Objectives

- To increase access to affordable and reliable piped WS in targeted urban centers;
- To improve financial viability of Ghana Water Company Ltd (GWCL).

Financial Covenants

- Subsidiary agreement for on-granting financing proceeds to GWCL;
- Submission of GWCL audited financial statements.

Results Framework and Monitoring

- GWCL to meet 100% of cash obligations from collected revenues in five largest cities
  - WR ratio to be monitored;
- Staffing ratio to be monitored;
- Average GCWL wage to compare with private sector’s.

Operational Risk Assessment Framework

- No specific cost recovery risk identified beyond lack of accountability from GWCL with regard to compliance with performance targets.

Economic and Financial Analysis

- Summary discusses achievement of original assumptions made for income statement (NRW, collection, staff, energy, tariff…) and mentions that GWCL covers its “cash needs”, i.e., mostly O&M costs;
- No summary of GWCL past audited and future financial statements; no discussion on GWCL balance sheet, cash flows and financial ratios.

Comments

- Objective of recovering O&M costs from users was already achieved under the original project through efficiency gains and tariff adjustments
  - No minimum WR performance set;
  - No debt to be serviced.
Malawi -- Second National Water Development Project

Water Supply (89%); Water Resources Management (9%); Sanitation (2%)

IDA Grant: US$120 million (Additional Financing)

Project Development Objectives

- To increase access to sustainable WSS services in target areas and to improve water resources management at the national level.

Financial Covenants

- Working ratio (collected operating revenues divided by working expenses) of 1.1 as of June 2011 by Water Board
  - Downgraded from original project whose covenant was to cover O&M, depreciation and debt service by 2012;
  - Because of reported already high tariffs.
- Payment of water bills by Government agencies within 90 days.

Results Framework and Monitoring

- Working ratio (as defined above) to be monitored.

Operational Risk Assessment Framework

- Risk of not meeting WR covenant not listed, and thus mitigation measure not described.

Economic and Financial Analysis

- Simplified summary forecasts (income statement) of each Water Board provided identifying cash collection, cash O&M expenses, depreciation, financing costs, income tax and working ratio.

Comments

- Common sense approach for recovering O&M costs, while keeping an eye on operating income;
- Cash flow statement and balance sheet would have been welcome;
- Mitigation measure in risk assessment would have been welcome.
Niger -- Urban Water and Sanitation Project

Water Supply (80%); Sanitation (20%)

IDA Credit: US$90 million

Project Development Objectives

- To increase access to sustainable water supply services and to improve sanitation services in some urban areas in the Recipient’s territory.

Financial Covenants

- Restoration of urban WSS sector “financial equilibrium” by end 2012 and maintaining it thereafter.

Results Framework and Monitoring

- Definition of “financial equilibrium” provided: “previous year net cash flow from operations minus debt service and variation of working capital requirements positive or equal to zero”.

Operational Risk Assessment Framework

- Risk of not achieving “financial equilibrium” as a result of the Government not implementing recommendations of the Regulator for adjusting tariffs clearly identified;
- Possible Credit suspension for non-compliance referred to; and
- Program for controlling public water consumption proposed.

Economic and Financial Analysis

- Remarkably clear summary of the economic and financial analysis (available in the project files) in the PAD;
- Restoration of urban WSS sector “financial equilibrium” by end 2012 to be achieved through: (i) settlement of arrears Government (water bills) and WSS utility (debt service); (ii) initial13.4% and recurrent (2.5% per year) tariff adjustments; (iii) improvement of budgetary allocations for Government agencies water bills; and (iv) adjustment of on-lending conditions of Credit proceeds (half grant; half loan on IBRD conditions); and
- Reference to well-tested financial model used by WSS utility to monitor its financial performance; and
- Reference to well-tested financial model used by Regulator to assess tariff increase requests.

Comments

- Excellent example of clear proposals for addressing cost recovery issues in one of the poorest country of the world.
Lebanon -- Greater Beirut Water Supply Project

Water Supply: 100%

IBRD Loan: US$200 million

Project Development Objectives

- To increase the provision of potable water to the residents in the project area within the Greater Beirut region, including those in the low-income neighborhoods of Southern Beirut;
- To strengthen the capacity of the Beirut Mount Lebanon Water Establishment (BMLWE) in utility operation.

Financial Covenants

- Submission of BMLWE audited financial statements as of FY 2012;
- Submission of subsidiary agreements between Borrower and BMLWE.

Results Framework and Monitoring

- No financial indicator monitored.

Operational Risk Assessment Framework

- No specific cost recovery risk identified.

Economic and Financial Analysis

- On-lending conditions by Borrower to BMLWE not specified;
- Simplified cash accounting forecast suggesting that BMLWE can cover its O&M costs from collected user fees;
- Absence of clarity about cost recovery objectives (cash needs or utility cost).

Comments

- A technically complex project implemented by a cash rich WSS utility would have justified a state-of-the-art financial analysis along OMS 2.20 instructions.
Morocco -- Regional Potable Water Supply Systems

Water Supply: 100%

IBRD Loan: US$175 million (to ONEP, the Borrower, with the Government guarantee); foreign exchange risk borne by ONEP

Project Development Objectives

- To increase access to potable water supply for selected communities in six provinces

Financial Covenants

- ONEP debt service coverage ratio of 1.2;

Results Framework and Monitoring

- Number of rural communities that paid the front-end fee required to benefit from the project to be monitored.

Operational Risk Assessment Framework

- No ORAF provided in the PAD

Economic and Financial Analysis

- Very detailed analysis of ONEP various activities – bulk water supply, management (gérances) of municipal water systems and rural water supply – including
  a. Cross subsidies between activities;
  b. Alternative financing schemes and VAT regime;
- Reference to a sophisticated model of financial operations run by ONEP.

Comments

- Potentially loss making socially oriented project implemented by a WSS utility fully mastering its financial management;
- Project designed and appraised after careful review of financial consequences.
Armenia -- Municipal Water Project

Water supply (80%); Public Administration; Water, Sanitation and Flood Protection (20%)

IBRD loan: US$15 million – variable spread with 10 year grace period, 25 year repayment

Project Development Objectives

- To support improvement of the quality and availability of water supply in selected service areas of the Armenian Water and Sewerage Company (AWSC).

Financial Covenants

- None.

Results Framework and Monitoring

- Several ratios measuring improvement of commercial operations (billing, collection, arrears…) to be monitored;
- No specific cost recovery/financial ratio to be monitored.

Operational Risk Assessment Framework

- Risk of insufficient revenue to cover O&M costs identified;
- Government committed to increase tariff as of 2013.

Economic and Financial Analysis

- No reference to AWSC past financial situation (this is the third Bank financed project since 2004); 2010 audit report mention that AWSC is basically on the verge on bankruptcy as a result of large accumulated losses;
- No financial forecast of AWSC operations;
- FIRR and NPV of project estimates conclude to the feasibility of sub-project.

Comments

- Good practice economic and financial analysis of the construction project;
- Analysis missing a discussion of AWSC financial recovery plan (whose submission should have been a condition of effectiveness).
Tajikistan -- Second Dushanbe Water Supply Project

Water Supply: 100%

IDA Grant: US$16 million

Project Development Objectives

- To improve water utility performance and water supply services in selected areas of Dushanbe.

Financial Covenants

- Debt service coverage of 1.2;
- Working ratio of 0.90 to be achieved through tariff adjustments and subsidies.

Results Framework and Monitoring

- Working ratio to be monitored;
- Registration and billing of residential customers to be monitored;
- Accounts receivable to be limited to 15% or revenues.

Operational Risk Assessment Framework

- Operational performance improvement action plan (OPIAP) clearly identifies seven activities – including tariff adjustments, and improvement of commercial and accounting procedures – aimed at achieving agreed financial performance;
- Risk of not achieving financial performance rated Medium-I.

Economic and Financial Analysis

- On-lending term by Ministry of Finance to WSS utility discussed upfront (grant) to allow compliance with debt service covenant (debt still has to be serviced on earlier loans);
- Foreign exchange risk transferred to utility on earlier loans;
- Detailed discussion of income statement and unbalanced revenue base and collection issues;
- High NPV/FIRR estimated based on assumptions that financial recovery plan is implemented;
- Very high EIRR estimated (100%) valuing avoided water losses at cost recovery tariff;
- Discussion of affordability included;
- Discussion on fiscal impact included

Comments

- Clear financial objectives and action plan;
- Would have benefitted from a one page summary of utility past and future financial statements.
Bangladesh -- Rural Water Supply and Sanitation Project

Water Supply: 80%; Sanitation: 20%

IDA Credit: US$75 million

Project Development Objectives

- To increase provision of safe water supply and hygienic sanitation in the rural areas of Bangladesh where shallow aquifers are highly contaminated by arsenic and other pollutants;
- To facilitate early emergency response.

Financial Covenants

- No specific cost recovery covenant.

Results Framework and Monitoring

- No specific cost recovery indicator to be monitored

Operational Risk Assessment Framework

- The risk that “the private sector may lack the financial incentive to invest in rural piped schemes given the complexity of the task, lack of technical capacity, manpower and resources, not to mention uncertain financial returns” to be addressed to government grant of 70% of project cost;
- The risks that communities may not want to connect and pay for piped water and private sponsors may not appreciate right levels of tariff and that altogether piped systems become financially unsustainable to be addressed by a combination of awareness building and community involvement.

Economic and Financial Analysis

- Very detailed economic analysis based on public health benefits;
- Very clear cost recovery objectives sought for private piped systems (O&M, return on equity invested of 30% of project cost, and contribution to a reserve fund)

Comments

- Detailed coverage of key cost recovery issues for piped rural systems developed by local private sponsors;
- Detailed discussion of criteria for selecting private sponsors.
India – Second Kerala Rural Water Supply and Sanitation Project

Water Supply: NA; Sanitation: NA (supposedly 100%)

IDA Credit: US$155.3 million

Project Development Objectives

- To increase access of rural communities to improved and sustainable water supply and sanitation services in Kerala, using a decentralized, demand-driven responsive approach.

Financial Covenants

- Capital cost sharing arrangement between local governments and beneficiary communities (100% of O&M costs to be borne by communities).

Results Framework and Monitoring

- “Sustainability index” – a combination of source, technical, financial and institutional assessments – of operational water schemes to be monitored.

Operational Risk Assessment Framework

- No specific cost recovery risk identified among the many risks associated with the project.

Economic and Financial Analysis

- No analysis in Annex; summary concludes to economic benefits.

Comments

- Actual cost recovery arrangement likely to be difficult to monitor;
- Sustainability index likely to be open to subjective interpretation.
China -- Sichuan Small Towns Development Project

Water Supply 10%; Pollution Management and Environmental Health: 20%
IBRD Loan: US$100 million, of which US$24 million for water supply, drainage and wastewater

Project Development Objectives

- To improve priority infrastructure in the Project counties/Districts in Sichuan Province.

Financial Covenants

- Xinjin County in Chengdu Municipality to submit audited financial statements, financial projections to show that operating and non-operating revenues are sufficient to cover total O&M expenses for the wastewater treatment plant built under the project.

Results Framework and Monitoring

- No reference to cost recovery.

Operational Risk Assessment Framework

- No ORAF.

Economic and Financial Analysis

- Least cost solution analysis for WSS projects;
- No financial analysis of agencies implementing WSS components of the project, but fiscal analysis to confirm availability of counterpart funds for project;
- Need for allocating adequate O&M budgets identified.

Comments

- WSS component probably too small for justifying focus on utility-type financial covenants.
Vietnam -- Urban Water Supply and Sanitation Project

Water Supply, Sanitation and Flood Protection: 100%

IDA Credit: US$200 million

Project Development Objectives

- To increase access to sustainable water services and environmental sanitation in selected areas in Project Provinces.

Financial Covenants

- Recipient to make sub-loans to Water Supply Companies (WSCs) in accordance with eligibility criteria;
- Recipient to: (i) take necessary steps, including but not limited to tariff increases to enable WSCs to maintain Working Ratio below 90%; and (ii) share the annual debt service with the companies as may be determined based on annual reviews of the financial situation of WSCs; and
- Recipient to: (i) enable the Project Provinces to achieve full cost recovery of their O&M expenses; (ii) provide the Project Provinces with financial support as needed for them to meet their financial obligations.

Results Framework and Monitoring

- Working ratio (cash O&M expenses divided by collected revenues) of WSCs to be monitored.

Operational Risk Assessment Framework

- WSC unwillingness to apply tariff in timely manner to be mitigated by subsidies to be provided by Provinces.

Economic and Financial Analysis

- Carried out for each WSC; some are likely to cover O&M and debts service; some would need to share the debt service burden; some would need their debt service to be borne by the Recipient.

Comments

- Clear cost recovery objectives; well adapted monitoring indicators and pragmatic approach to debt service coverage.
Brazil -- Sergipe Water Project

IBRD Loan: US$70 million

Sewerage: 50%; Water Supply: 25%

**Project Development Objectives**

- To promote the efficient and sustainable use of water in the Sergipe River Basin by strengthening the State’s sector management, enhancing soil management practices and improving water quality.

**Financial Covenants**

- None

**Results Framework and Monitoring**

- State WSS utility EBTIDA margin to improve from 11.7% in 2010 to 16.7% in 2015.

**Operational Risk Assessment Framework**

- Risk on not meeting EBTIDA objective not identified.

**Economic and Financial Analysis**

- Most investment are financed by the State and are recorded as capital increase;
- Detailed analysis of State WSS utility past financial performance (cost recovery indicators, accounts receivable);
- Detailed analysis of future financial performance, recovery of O&M costs, debt service, contribution to CAPEX and cash position.

**Comments**

- Cost recovery of revenue earning entity adequately covered.
Mexico -- Water Utilities Efficiency Improvement Project

IBRD Loan: US$100 million

Water Supply: 50%; Sewerage: 25%; Central Government Administration: 25%

**Project Development Objectives**

- To improve the efficiency of participating water utilities through the provision of technical assistance and financing.

**Financial Covenants**

- None.

**Results Framework and Monitoring**

- Number of water utilities whose collected revenues in local currency per m3 produced increase by 5%;
- Number of water utilities whose energy consumption in kWh per m3 produced decreases by 5%;
- Number of water utilities showing efficiency improvements by 5%;
- Average absolute increase in global efficiency in water utilities that participated in then project for at least 2 years;
- National tariff system availability on user friendly website.

**Operational Risk Assessment Framework**

- No specific cost recovery risk identified.

**Economic and Financial Analysis**

- Financial analysis refers to “financial sustainability” but does not define it;
- Financial analysis regrets absence of audited financial statements, but project does not monitor the number of utilities issuing such reports.

**Comments**

- It is not clear what cost recovery objective is pursued.
Panama -- Metro Water and Sanitation Improvement Project

IBRD Loan: US$40 million

Water Supply: 60%; Sewerage: 20%; General Water, Sanitation and Flood Protection: 20%

Project Development Objectives

- To assist the Borrower in increasing the quality, coverage and efficiency of its WSS services in the low-income neighborhoods of selected areas of the Panama Metropolitan Region.

Financial Covenants

- No specific cost recovery covenant.

Results Framework and Monitoring

- Revenue collection in US$/year per capita to be monitored.

Operational Risk Assessment Framework

- No ORAF provided in the PAD.

Economic and Financial Analysis

- Extremely detailed analysis focusing on: (i) the loss making utility IDAAN future financial situation; and (ii) the financial and economic benefits of the project;
- The analysis of IDAAN future financial situation does not however result in a clear financial recovery plan and thus in a specific cost recovery covenant;
- The analysis of incremental benefits concludes that the project is justified from both the financial and economic point of view.

Comments

- Can the Bank support a financially and economically justified project implemented by a WSS utility company that does recover its costs from billings and experiences difficulties collecting its bills without agreeing on a financial recovery plan, even with modest objectives?
- A very well documented analysis, that does not try to hide the situation, will ease the task of evaluation of the project achievement at completion.
Peru -- National Rural Water Supply and Sanitation Additional Financing

IBRD Loan: US$30 million

Water Supply: 45%; Sanitation 45%; Sub-national Government Administration: 6%; Central Government Administration: 4%

Project Development Objectives

- To increase the sustainable use of water supply and sanitation facilities in rural areas and small towns while emphasizing improvement in hygiene and training in operations and maintenance.

Financial Covenants

- No specific cost recovery covenant.

Results Framework and Monitoring

- Number of rural WSS operations that record payment by users to be monitored;
- Number of operations with operational income greater or equal to 110% of its operational expenditure to be monitored;
- Percentage of billing on the basis of metered consumption to be monitored

Operational Risk Assessment Framework

- No specific cost recovery risk identified.

Economic and Financial Analysis

- Mostly discussing criteria for selecting beneficiary communities on the basis on NPV and EIRR of projects.

Comments

- Project simply aiming a recovering O&M costs and replenishing a small reserve fund for replacement of equipment.
ANNEX 5. CAPITAL SUBSIDIES AND ON-LENDING ARRANGEMENTS

A Borrower has obtained an IDA Credit of $120 million reimbursable over 30 years, of which a 10-year grace period at service rate of 0.75 percent for an urban WSS project to be implemented by its National WSS Utility (NWSSU). In the Borrower’s country private real estate developers have recently obtained loans from local banks reimbursable in constant annuities over five years without grace period at an interest rate of 12 percent.

Because the Borrower wishes to limit the debt service of the NWWSU to about $8.4 million/year, it envisages on-lending the proceeds of the IDA Credit in local currency on the following “concessional” terms: repayment in 20 years, of which eight years of grace and interest rate of 7 percent.

The present value (PV) at a discount rate of 12 percent, i.e., the interest rate of “commercial” loans representing the opportunity cost of capital, of the repayments of the IDA Credit over a 20-year period is $17.3 million.

The PV of repayments of the concessional loan over 20 years would be $78.7 million, while that of the “benchmark” commercial loan would be $120.0 million. Thus the “implicit” capital subsidy of this on-lending arrangement would be 120 - 78.7 = $41.3 million. The fiscal gain for the Borrower, i.e., the difference between the PV of repayments by the NWSSU of the concessional loan and repayment by the Borrower of the IDA Credit would be $61.4 million.

In order to build NWSSU credibility with local lenders, it is envisaged to on-lend $78.7 million on terms similar to commercial loans and provide $41.3 million as an explicit capital subsidy directed towards specific sub-projects with a strong social content. NWSSU debt service for the commercial loan “A” during the five years would be almost three times that for the above concessional loan ($21.8 million/year vs. $8.4 million/year). But the fiscal gain for the Borrower would remain a $61.4 million.

For limiting NWSSU debt service during the first five year to $8.4 million, the commercial loan “B” would have to be limited to $30.3 million and the capital grant increased to $89.8 million. The fiscal gain of the Borrower would be significantly reduced, but still positive at $13 million.

The last option should normally be considered:

- NWSSU borrows on commercial terms and if able to service the debt, could later negotiate commercial loans because of its good credit rating;
- The Borrower still makes fiscal profit over the long term.
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<p>| Benchmark Loan | $ mio | 120.0 |</p>
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| Development Grant | $ mio | 89.8 |
ANNEX 6. CHECKLIST FOR WATER SECTOR PAD/PROJECT REVIEWS

Below is the current checklist suggested by the Water Anchor for reviewing the content of a PAD for a water project. The checklist would have to be complemented with the more precise recommendations on PDO, RF, ORAF, financial analysis and covenants summarized in Part 4 of the Note.

I. Project concept, objectives and design
   1) Does the water sector knowledge and strategy adequately underpin the project? (Sector specific analysis and more general public expenditure reviews, etc.)
   2) Does the project have a focus on poverty?
      a) If so, are the direct and indirect impacts on the poor clearly articulated?
   3) Have adequate arrangements been made for monitoring and evaluation of social impacts including poverty impact? (Is there a baseline survey? Targets specified? Financing for ex-post evaluation?)
      a) If so, are these arrangements discussed in the document?
   4) Does the project have a gender-responsive design?
      a) If so, is the gender plan adequately discussed in the document?
   5) Does the project have the appropriate water-related sector and theme codes? If no, which codes should be included?
   6) Is this an “integrated” water project, i.e. with at least one theme code from two of the three relevant theme groups (Urban Development, Rural Development, and/or Environment and Natural Resource Management)?
   7) Have water demand management approaches (including fees, tariffs and quotas) been considered?

II. Technical aspects
   1) Is this project based on well-tested technologies, appropriate for current country conditions?
   2) Have you considered the potential role of ICT in this project?

III. Environmental aspects
   1) Have you considered the Water Resource Management implications of this project (i.e. impact on water quality, water quantity, etc.)?
2) Does the project have an activity evaluating climate change impacts and risks?  
   a) If so, is this clearly articulated in the document?

3) Has environmental restoration to meet water-related objectives been considered?  
   a) Has this been discussed in the document?

IV. **Financial aspects**
   1) Does the document contain adequate information on financial management?
   
   2) Does the financial analysis go beyond the implementation period?
   
   3) Does this project involve cost recovery?

If yes, is the extent discussed in the document? If no, what is the stated rationale
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