



Bank Netherlands
Water Partnership

THE WORLD BANK GROUP

Town Water Supply and Sanitation Companion Papers

Volume 3

Contributors

Richard Hopkins
David Satterthwaite
Donald Lauria
Barry Walton
Colin Schoon
Paul Stott
Jo Smet
Klas Ringskog
Bruno Valfrey
Bernard Collignon
Stephen Myers
Klaas Schwartz
Jack Cresswell
Solveig Nordström
Stephen Gasteyer

Editor

Brian Appleton

Bank Netherlands Water Partnership
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Town Water Supply and Sanitation Initiative
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Brian Appleton

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Richard Hopkins &
David Satterthwaite
Donald Lauria
Donald Lauria
Barry Walton & Colin Schoon
Paul Stott

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Jo Smet
Klas Ringskog
Bruno Valfrey & Bernard
Collignon
Stephen Myers
Barry Walton & Colin Schoon
Klas Ringskog
Klaas Schwartz

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Jack Cresswell
Solveig Nordström
Klas Ringskog & Stephen
Gasteyer

**Town Water Supply
and Sanitation Services
Volume 3**

**An Alternative Perspective on WSS Services
(including the “Grey Area”)**

Companion Paper A1

**Richard Hopkins, WSP – East Asia
July 2003**

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An Alternative Perspective on WSS Services (including the “Grey Area”)

Richard Hopkins, WSP– East Asia
July 2003

Introduction

Historically the approaches to water supply and sanitation (WSS) services have been defined as being either “urban” or “rural”, or similar terminology in languages other than English. These terms often have administrative significance, unrelated to issues of WSS services, but giving rise to some difficulties in approaches and outcomes for end-users. A universally challenging area is in small towns, which seem to fall between ‘large urban’ and ‘small rural’ settlements, and are typically not well served, even in many developed countries. In the developing world, where access to WSS services is low across all settlement sizes, traditional approaches have not been working well, provoking the search for more effective ways of improving access.

Back to Basics

The best place to start is at the beginning, by re-examining the fundamental structure of the sector and the assumptions implicit in approaches to service provision, especially:

- the nature of water resources
- the nature of settlements (their evolution and the process of urbanization)
- corresponding social, technical and administrative aspects of the development and management of WSS services.

Settlement patterns vary greatly, physically and over time. People gather in settlements, and settlements evolve, for a number of reasons. They may start from a market at a road junction, or follow an access route (as in Figure 1), and slowly build on these foundations, attracting more people with more reasons for wanting to be there at that time. The reasons and the settlements will not remain static and will change over time.

As settlements change, so too will administrative boundaries. What is a village today may be two villages or a town tomorrow. As towns and cities grow, they take over or merge with surrounding settlements and decisions are made about their boundaries. At what point is a village called a town, and a town called a city?

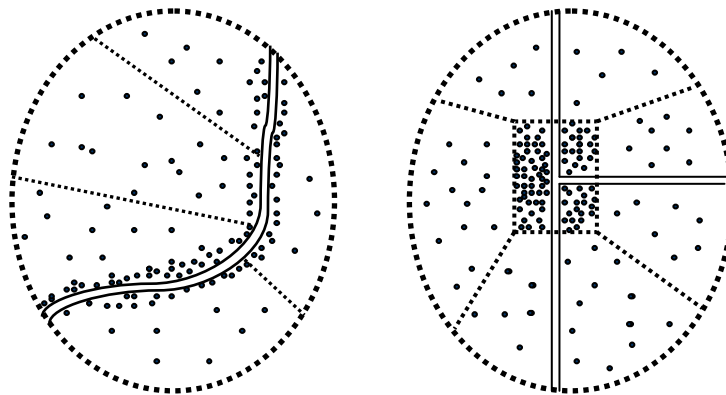


Figure 1 – The nature of settlements

Settlements are not homogeneous; within the boundaries of villages, towns and cities, there is wide variation in the density of settlement (how closely people live together), socio-economic groups and classes of housing. These factors are important for the provision of services.

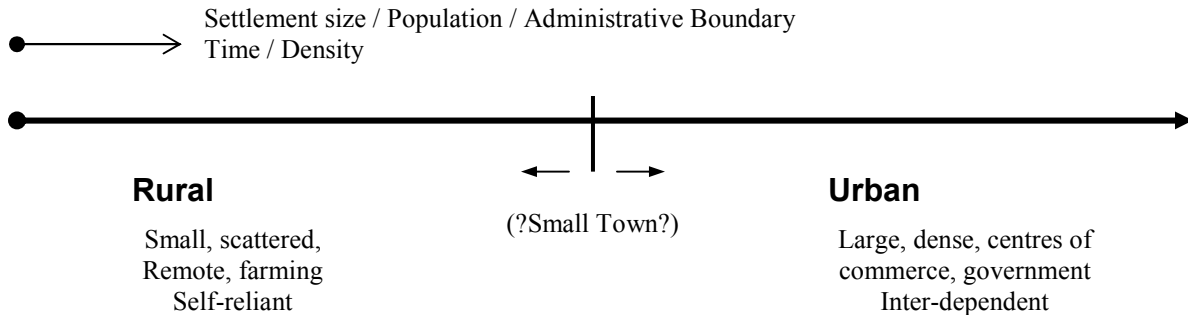


Figure 2 – 1-D settlement classification as Rural or Urban

Traditional classification of approaches to service provision has split the sector into ‘rural’ and ‘urban’ sub-sectors. At the extremes, or applying clichés to these terms, as shown in Figure 2, it is relatively easy to see the differences. Box A1.1, based on the paper contributed by David Satterthwaite, lists typical characteristics that are used to distinguish rural and urban settlements. As the author makes clear, the distinction is “a gross simplification” and in effect settlements fall into a rural-urban continuum. Nevertheless, the labels do have considerable significance when it comes to political priorities and economic development opportunities. And they influence the type of services considered appropriate for individual settlements.

In practice, the rural/urban terminology has come to represent administrative and bureaucratic boundaries more than the nature of settlements; classifications like this determine whose authority prevails, especially when it comes to allocation of responsibilities and budgets between ministries and departments. Within many governments and between many agencies, the perspective on this boundary and its position are often hotly contested. As shown in Figure 3, the clean administrative approach would be to define a division which could be applied to all aspects of sector activities, in financial and physical terms; the problem is simply one of defining the dividing line. As the definitions of the terms are vague and administrative, the rationale for defining any firm boundary position becomes tenuous and arbitrary, but it has huge implications for the approaches taken to providing services.

Box A1.1: The rural-urban continuum

Dividing a nation’s population into ‘rural’ and ‘urban’ and assuming that these have particular characteristics in terms of the settlements they live in and the sector in which they earn a living has always been a gross simplification. It has also led to development specialists dividing into ‘rural’ and ‘urban’ camps, which have ignored the extent to which rural households rely on urban income sources – through remittances from family members, commuting, or producing for urban markets – while many urban households in low-income nations depend on rural resources and reciprocal relationships with rural households.¹

If our concern is to reduce poverty (and within this to strengthen national, regional and local economies wherever possible), there is a need to forget the rural–urban divide and see all settlements as being in a continuum with regard to both their population size and the extent of their non-agricultural economic base. Figure 1 illustrates this. Here, key ‘rural characteristics’ are listed on the left and key ‘urban characteristics’ on the right.

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RURAL	URBAN
<p>Livelihoods drawn from crop cultivation, livestock, forestry or fishing (i.e. key for livelihoods is access to natural capital)</p> <p>Access to land for housing and building materials not generally a problem</p> <p>More distant from government as regulator and provider of services; community-based decision making is a preferred option</p> <p>Access to infrastructure and services limited (largely because of distance, low density and limited capacity to pay?)</p> <p>Less opportunities for earning cash, more for self-provisioning; greater reliance on favourable weather conditions</p> <p>Access to natural capital as the key asset and basis for livelihoods</p>	<p>Livelihoods drawn from labour markets within non-agricultural production or making/selling goods or services</p> <p>Access to land for housing very difficult; housing and land markets highly commercialized</p> <p>More vulnerable to ‘bad’ governance so requiring robust formal institutional frameworks to manage services</p> <p>Access to infrastructure and services difficult for low-income groups because of high prices, illegal nature of their homes (for many) and poor governance</p> <p>Greater reliance on cash for access to food, water, sanitation, employment, garbage disposal.....</p> <p>Greater reliance on house as an economic resource (space for production, access to income-earning opportunities; asset and income earner for owners – including <i>de facto</i> owners)</p>
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The characteristics listed under each column are two ends of the continuum. Most rural settlements have households that rely on non-agricultural jobs, and non-agricultural employment opportunities may be very important for reducing rural poverty. Landless labourers are generally among the poorest of the rural poor, and they too require better income-earning opportunities, just like the urban poor. Meanwhile, most urban areas exhibit some rural characteristics – for instance, urban agriculture is important for many low-income urban households. In the middle of this continuum is a ‘rural–urban’ interface in which rural and urban characteristics are mixed. Most towns in low and middle-income nations will have such a mix.

Based on a paper prepared for the TWSSI by David Satterthwaite of IIED.

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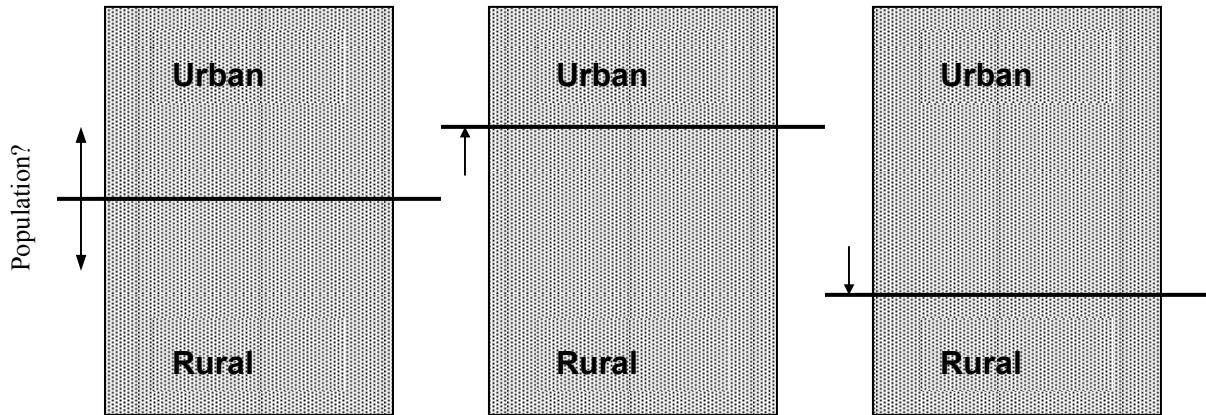


Figure 3 – Dividing the Sector: where is the boundary?

The approaches that are implicit in this traditional subdivision are often based on stereotypical understandings of the settlements and clientele (as in Figure 2), in some cases softened by lessons learned from past experience. For example, in many countries all sector development was delivered directly by Government in a “top-down” way, with decisions made centrally, or at least remotely, and with minimal consultation with intended beneficiaries. Failures were most apparent in the ‘rural’ sub-sector, and in most cases approaches for that segment have been modified to become more inclusive, consultative and “bottom-up,” allowing user communities more involvement in decision-making and management of their own services. Meanwhile “top-down” approaches continued to be applied to the ‘urban’ sub-sector, often accompanied by attempts to expand the bureaucratic territory by moving the dividing line and applying these ‘urban’ approaches to ever smaller settlements.

The Realities

In the field, there are limitations to the “bottom-up” approaches. As systems become larger and more complex, the ‘rural’ models seem to fail. Similarly, at the other end of the spectrum, the “top-down” institutional approaches result in a higher proportion of failures as settlement sizes become smaller (as had been the case earlier for ‘rural’ applications). In fact, the truly ‘urban’ approaches serve a relatively small proportion of the population, and the truly ‘rural’ approaches a similarly small proportion. Between the two is not a boundary line as much as a large gap – a fuzzy “grey area” (Figure 4.) – containing a large proportion of the population that is not well served, or not served at all, by either approach.

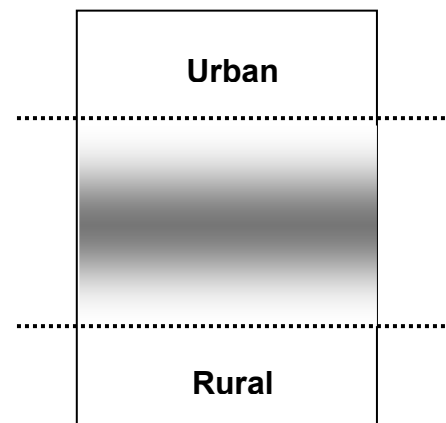


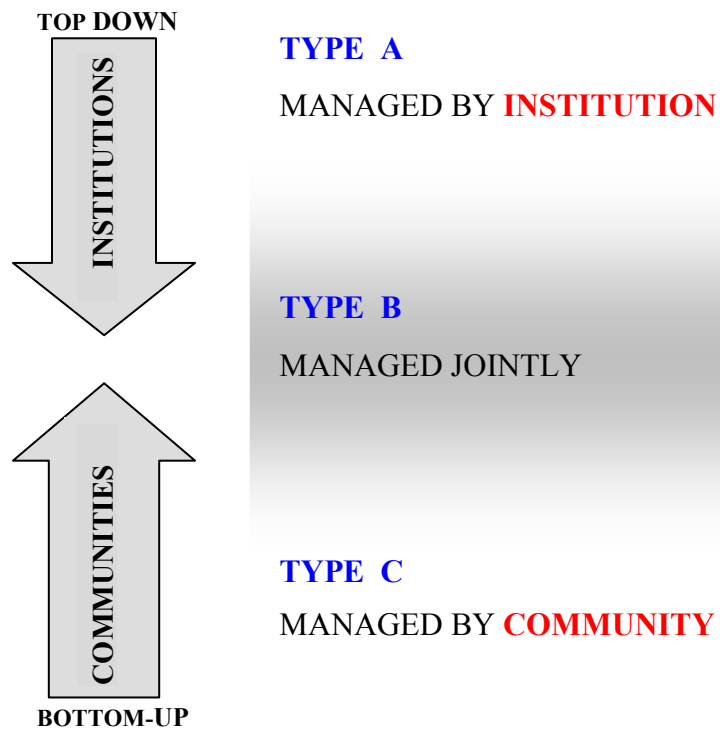
Figure 4 – The sector as it is

What does this “grey area” look like in reality? Who, and where, are this large number of under-served and un-served households? Most are in medium-sized settlements – the ‘small towns,’ peri-urban areas at the fringe of larger cities, and the inner city poor who live a more ‘collective’ or ‘rural’ lifestyle. Looking again at the nature of settlements, we are reminded that they are not homogeneous. Within the boundaries of most large cities there are areas where population densities are low, and others where people live outside the formal economy, much as they do in ‘rural’ areas. They are also at the margins of the larger ‘rural’ areas, beyond the effectiveness of uniform community management approaches. We need to understand more about the “grey areas” if the great majority of the population is to have access to improved water supply and sanitation services. In fact, we need a new paradigm, which allows for indistinct boundaries and fuzzy “grey areas” where different approaches are not only possible, but can be examined and defined with greater clarity.

An Alternative Perspective

This alternative perspective of the WSS sector is based on **decision-making** – sometimes loosely called management. The key feature is who makes the important investment decisions. Under this model there are two generic classes or types of decision-makers, called ‘community’ and ‘institution.’

It is important to define the key terminology carefully, to ensure a common understanding of what these terms mean in this context. Even though they are apparently imprecise collective nouns, they were chosen deliberately so as not to limit the scope and application of the concept.



Briefly:

Community means a socially cohesive group of householders, whose currency of transactions involves trust.

Institution means a formal or legal arrangement, outside a community group, whose currency of transactions involves money.

Figure 5 – An alternative perspective based on decision-making or management

Under this definition, ‘community’ can be quite a small group of people who know and trust one another, or can exert social pressure equivalent to trust. In terms of WSS it

covers the range from a single household up to a neighborhood or hamlet. The maximum size will vary widely among different cultures and countries, perhaps up to a whole village or suburb; interestingly, it can only be determined by the community itself.

Examples of institutions include a wide range of enterprise models, from public-sector entities, private-sector companies and joint public-private arrangements, partnerships and sole-trader businesses, through to cooperatives and NGOs. In the public sector in many countries, most services including electricity and communications as well as water supply and sanitation were funded, built and managed by “government” directly through line ministries and departments. While the constitutional authority may still reside with “government,” now the preferred delivery is most often through service providers: ‘corporatized’ autonomous public-owned entities, through to fully ‘privatized’ models, with many variations between. For the purposes of this discussion, it is important to clarify who is the investment decision-maker – the ‘institution’ under this definition. In all cases, the relationship between the institution and the end-user is a business-like one, as between supplier and customer, even when the institution is a not-for-profit entity.

Communities are also encouraged to be more institutional and business-like in their internal management practices, including forming committees and managing user payments. However, these informal practices are distinct from the formal and legal arrangements which define an ‘institution’.

The “Grey Area”

Understanding and applying this deceptively simple concept implies quite a radical change in perspective. It is not simply a matter of changing terminology, e.g. using ‘urban’ and ‘institutionally-managed’ interchangeably, and equating ‘rural’ with ‘community-managed’, or adjusting the terminology to apply it to the status quo. It means changing from an administrative boundary approach to one based on decision-making or management models. At the far extremes the changes are less significant, e.g. individual and small groups of households agreeing to share a well or handpump, and in large cities each householder paying a municipal water supply company for connection to a piped water system and for the water used each month. But the new perspective allows for mixing these approaches across traditional boundaries, opening up an exciting range of possibilities.

For water supply, examples of joint management by institutions and communities include a number of variations on the theme of the institution providing bulk water supplies to a certain point, with communities responsible for the distribution arrangements beyond that point, and for collection of money and payment to the institution. In effect this means changing the normal boundary; instead of the institution having a relationship with each individual household, the institution’s customer is a community group of households. The institution is not concerned with the details of what happens within the community: how the water is distributed and levels of service (pipe network, public taps, house connections) nor the formula and mechanisms for payment (equal share, volumetric, according to means, internal credit arrangements, etc.). Some practical examples:

- a single, metered, bulk offtake from a city water supply network (institutionally-managed) serving a group of households or neighborhood, with the community managing internal distribution and payments through a neighborhood committee or similar.
- a public standpipe on a large piped network, sustainably managed by the community it serves through a formal arrangement between the institution and the community group
- a bulk distribution system serving several villages or hamlets; the bulk supplies being managed by an institution (see definition) and the internal arrangements within each community, and payments, being managed by that community.

Other examples or variations on possible arrangements within the “grey area” include:

- communities deciding to contract a service provider to undertake some or all aspects of water supplies, while still retaining the ultimate decision-making powers
- town water supply companies providing bulk supplies only, with each neighborhood deciding on their internal distribution and management arrangements, collectively and/or sub-contracting aspects of the services to small-scale service providers
- towns served with hybrid systems by design, allowing options for community-managed elements to convert to direct individual house connections, and for community-developed and managed sources to supply surplus water into the town network.

These are but a small sample to whet the imagination. The “grey area” is not a physical area, limited to the examples of small towns, urban fringes and multi-village systems as mentioned above; the “grey area” is the potential for joint approaches to managing WSS services, and exists within the boundaries of cities, towns and villages. It can be the key to some of the previously locked doors, such as natural monopolies, direct investment and financial contributions for infrastructure from private households, community groups and small and medium enterprises. The concept can be further developed to examine and clarify the roles and responsibilities of the different parties under each model.

When this perspective has been presented to workshops for policy-makers, sector professionals and end-users, the participants have invariably come up with a number of new possibilities relevant to their situations. Applying this paradigm opens up a range of options, often not previously considered, for offering users real choices in service levels. Offering informed choices to decision-makers at the lowest appropriate level is the fundamental basis of demand-responsive approaches, which are strongly positively correlated with sustainability of WSS services.

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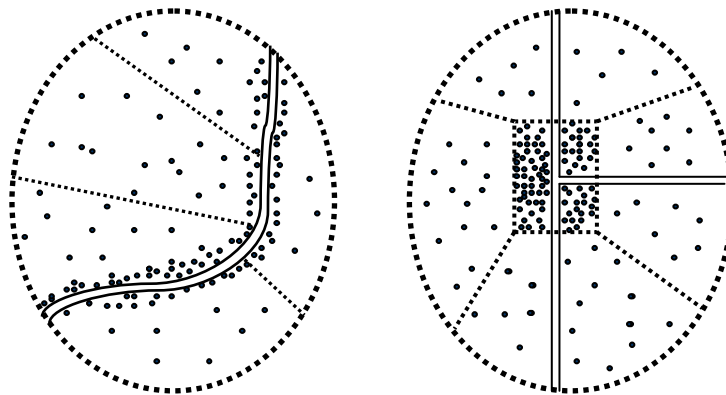


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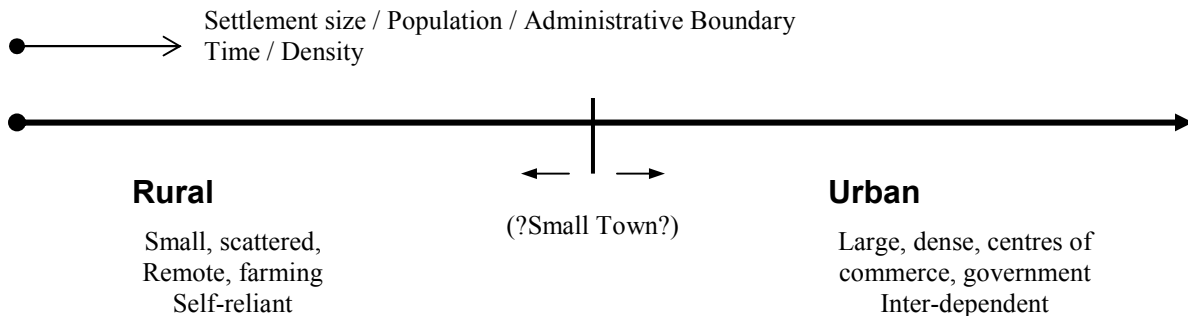


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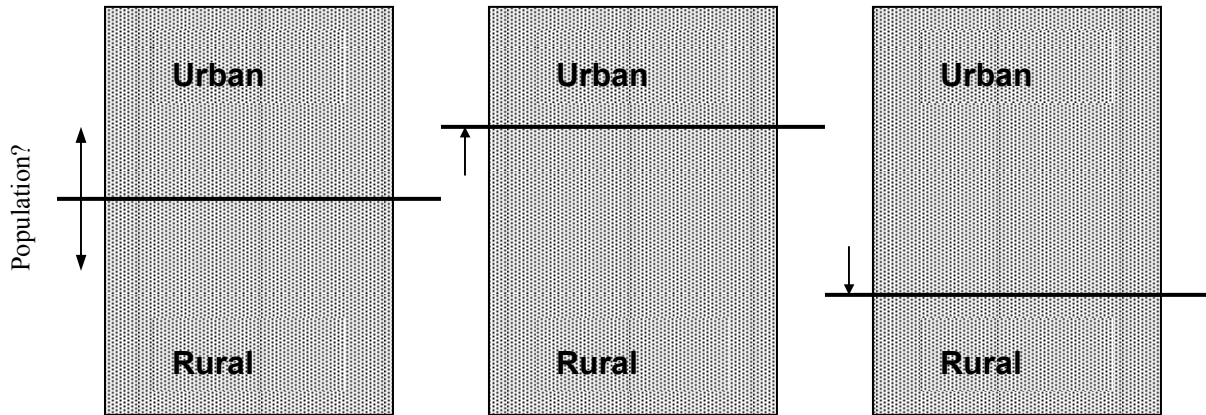


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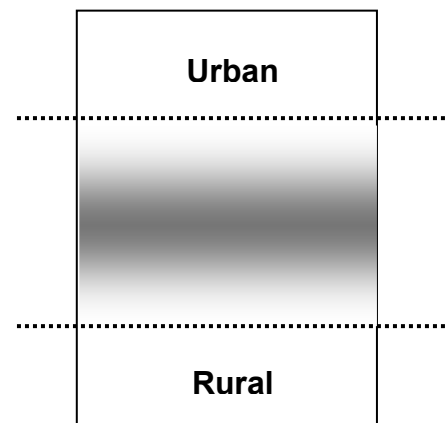


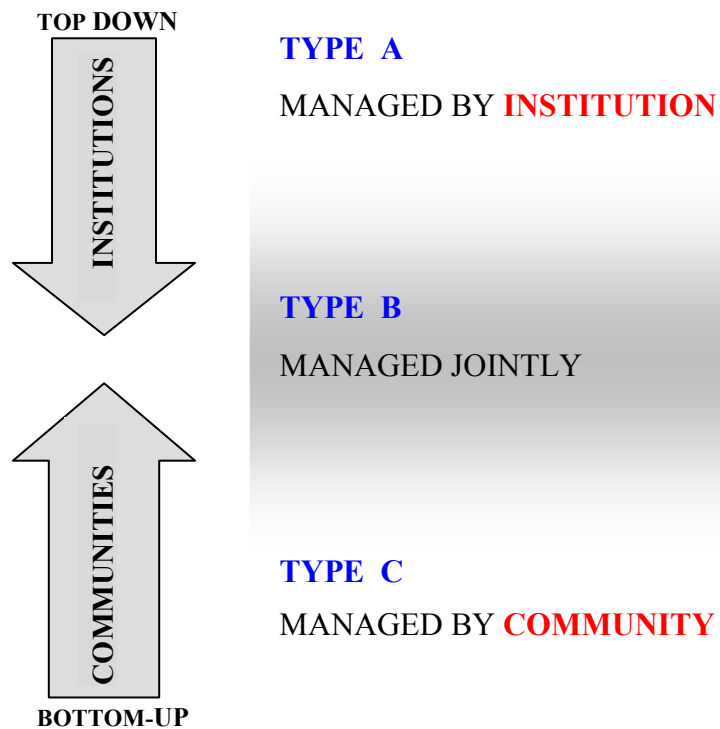
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Communities are also encouraged to be more institutional and business-like in their internal management practices, including forming committees and managing user payments. However, these informal practices are distinct from the formal and legal arrangements which define an ‘institution’.

The “Grey Area”

Understanding and applying this deceptively simple concept implies quite a radical change in perspective. It is not simply a matter of changing terminology, e.g. using ‘urban’ and ‘institutionally-managed’ interchangeably, and equating ‘rural’ with ‘community-managed’, or adjusting the terminology to apply it to the status quo. It means changing from an administrative boundary approach to one based on decision-making or management models. At the far extremes the changes are less significant, e.g. individual and small groups of households agreeing to share a well or handpump, and in large cities each householder paying a municipal water supply company for connection to a piped water system and for the water used each month. But the new perspective allows for mixing these approaches across traditional boundaries, opening up an exciting range of possibilities.

For water supply, examples of joint management by institutions and communities include a number of variations on the theme of the institution providing bulk water supplies to a certain point, with communities responsible for the distribution arrangements beyond that point, and for collection of money and payment to the institution. In effect this means changing the normal boundary; instead of the institution having a relationship with each individual household, the institution’s customer is a community group of households. The institution is not concerned with the details of what happens within the community: how the water is distributed and levels of service (pipe network, public taps, house connections) nor the formula and mechanisms for payment (equal share, volumetric, according to means, internal credit arrangements, etc.). Some practical examples:

- a single, metered, bulk offtake from a city water supply network (institutionally-managed) serving a group of households or neighborhood, with the community managing internal distribution and payments through a neighborhood committee or similar.
- a public standpipe on a large piped network, sustainably managed by the community it serves through a formal arrangement between the institution and the community group
- a bulk distribution system serving several villages or hamlets; the bulk supplies being managed by an institution (see definition) and the internal arrangements within each community, and payments, being managed by that community.

Other examples or variations on possible arrangements within the “grey area” include:

- communities deciding to contract a service provider to undertake some or all aspects of water supplies, while still retaining the ultimate decision-making powers
- town water supply companies providing bulk supplies only, with each neighborhood deciding on their internal distribution and management arrangements, collectively and/or sub-contracting aspects of the services to small-scale service providers
- towns served with hybrid systems by design, allowing options for community-managed elements to convert to direct individual house connections, and for community-developed and managed sources to supply surplus water into the town network.

These are but a small sample to whet the imagination. The “grey area” is not a physical area, limited to the examples of small towns, urban fringes and multi-village systems as mentioned above; the “grey area” is the potential for joint approaches to managing WSS services, and exists within the boundaries of cities, towns and villages. It can be the key to some of the previously locked doors, such as natural monopolies, direct investment and financial contributions for infrastructure from private households, community groups and small and medium enterprises. The concept can be further developed to examine and clarify the roles and responsibilities of the different parties under each model.

When this perspective has been presented to workshops for policy-makers, sector professionals and end-users, the participants have invariably come up with a number of new possibilities relevant to their situations. Applying this paradigm opens up a range of options, often not previously considered, for offering users real choices in service levels. Offering informed choices to decision-makers at the lowest appropriate level is the fundamental basis of demand-responsive approaches, which are strongly positively correlated with sustainability of WSS services.

**Town Water Supply
and Sanitation Services
Volume 3**

Appropriate Design of Town Water Systems

Companion Paper A2

**Donald Lauria, North Carolina University
September 2003**

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Companion paper A2: Appropriate Design of Town Water Systems

Donald Lauria, North Carolina University

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1. Introduction

Towns are distinct from cities and rural communities in numerous respects, requiring a distinctive approach to design of their water and sewer systems. Initial investment costs need to be controlled so that customers receive the least-cost solution for the level of service that they are willing to pay for. Historically, technical designs have tended to be driven by national standards that were intended for urban systems – themselves often based on inappropriate standards from industrialized countries. More often than not, the consequence is over-designed systems for predicted demands that never materialize, with the excess costs transferred to customers or simply leading to financial ruin of the utility.

This experience has led to questioning the suitability of designing town systems based on population growth statistics and projected demands (largely guesswork). It is argued that systems should instead be rolled out in a phased approach, reducing initial costs and allowing for expansion later based on actual future demands and the willingness of future customers to pay for it. However, to date there has not been any detailed analysis of such an approach. The objective of this paper is to analyze the options for taking a modular / phased approach to the design of water supply systems based on current demand and to map out the rational stepping up process for expansion.

2. Framework

Appropriate design of town systems is about decision making under uncertainty. The basic concepts are illustrated by the following example. Consider a town that has 50,000 population with no piped water system; many households however have their own well or share one with neighbors. An improved piped system will be constructed. Two alternative designs for it are under consideration: (i) a system that can serve 25,000 persons; and (ii) a system for 50,000 persons. The annual costs of the two systems that must be covered by revenue from users to ensure sustainability are:

Design Population	Annual Cost
25,000	500,000
50,000	900,000

The decision problem is which system to build: the smaller one for 25,000 persons, or the larger one for 50,000?

Because many households have their own water supply, it is uncertain how many people will use the improved system when it is built. The planners think only two alternatives are likely: either 25,000 persons will want to use it, or 50,000 will want to use it. These alternatives are referred to as “States of Nature.” Based on a willingness-to-pay survey, it is fairly certain that each person who uses the improved system will pay 20 per year.

Hence, the estimated annual revenues from users for the two alternative designs and two states of nature are as follows:

<i>annual revenue</i>	<i>States of Nature</i>	
<i>Alternative Designs</i>	25,000	50,000
25,000	500,000	500,000
50,000	500,000	1,000,000

Consider the (uncertain) State of Nature in which there are 25,000 users. Both designs can accommodate all the users and the annual revenue for each design would be 500,000. However, if the State of Nature turns out to be that 50,000 want to use the improved system, the smaller design could accommodate only half of them, and the annual revenue would be 500,000; of course, all 50,000 could be served if the larger design is built, in which case the revenue would be 1,000,000.

Sustainability of the system will depend on the financial self-sufficiency of the utility. Specifically, annual revenue less annual cost (net revenue) cannot be negative if the system is to be viable. The next table shows annual net revenues. Called the Payoff Matrix, it brings together information about the Alternative Designs and different States of Nature.

<i>net revenue</i>	<i>States of Nature</i>	
<i>Alternative Designs</i>	25,000	50,000
25,000	0	0
50,000	-400,000	100,000

For this example, positive table entries are preferable to negative numbers; e.g. the design for 50,000 and State of Nature where 50,000 want to use it is preferable to the design for 25,000 persons.

The Payoff Matrix lies at the heart of decision making. If we knew which State of Nature would prevail, decision making would be simple. For example, if we knew that 50,000 would use the new system, then the Payoff Matrix shows that it would be best to choose the design with larger capacity. But we don't know the State of Nature, especially in complicated real-world situations. In the face of such uncertainty, there are a few different ways to choose which design to build.

The first applies when there is complete ignorance about the State of Nature. It uses a very conservative basis for decision making called the Maximin criterion. The idea with our Payoff Matrix (where positive values are preferable) is to find the minimum payoff for each design (row), i.e. the worst possible outcome, and then select the design that has the largest minimum payoff – the best among the worst possible outcomes.

<i>Alternative Designs</i>	<i>Min Payoff</i>
25,000	0
50,000	-400,000

For this example, the design with smaller capacity (25,000 persons) is “less bad” than the one with larger capacity and hence would be selected (a payoff of zero is better than negative 400,000). There are different variations of this criterion, some of which are less conservative.

Another approach is to try to get some information about the probabilities that different States of Nature will occur. For example, a household survey might be made in which people are asked if they would use an improved water system, or would they continue to use their existing arrangement. Suppose it was found that the probability of 25,000 persons wanting to use the new system is 20%, and the probability is 80% that 50,000 persons would use it; i.e. probability is high that many people would use the new system. With probability values in hand (from surveys, expert opinion, or both), the Expected Payoff for each design can be calculated as $\sum P_i * X_i$ where P_i = probability that State-of-Nature i occurs, and X_i = payoff for State-of-Nature i . In the following table, the Expected Payoffs are shown in the first column [P(.2, .8)] for the assumption that the probability is 20% that 25,000 persons will use the new system (and 80% that 50,000 will use it), and in the second column. [P(.8, .2)] for the opposite assumption that the probability is 80% that 25,000 persons will use the new system and 20% that 50,000 will use it.

<i>expected payoff</i>	<i>Expected Net Revenue</i>	
<i>Alternative Designs</i>	P(.2, .8)	P(.8, .2)
25,000	0	0
50,000	0	-300,000

The first column of the Expected Payoff Matrix shows that if the chance is 20% that the number of users will be 25,000, then the expected net revenue is the same (zero) for both designs and the decision maker is indifferent between them. However, the second column shows that if the chance is four times higher (80%) that 25,000 will use the system, then the expected net revenue is much higher (0) with the smaller design than with the larger, and the best choice is the system for 25,000 persons.¹

This example shows that decision making under uncertainty includes four basic elements: 1) alternative designs; 2) states of nature; 3) the payoff matrix; and 4) criteria for decision making.

3. Alternative Designs

¹ Assume the chance is 20% that 25,000 will use the new system and 80% that 50,000 will use it. The expected net revenue for the design for 25,000 using these probabilities and data in the Payoff Matrix is: $0.2*0 + 0.8*0 = 0$. The expected net revenue for the design for 50,000 is: $0.2*-400,000 + 0.8*100,000=0$.

In this section, we focus on four issues from engineering, economics and psychology related to attitudes and practices about the design of water supplies in developing countries: (i) engineering practice; (ii) economies of scale; (iii) aversion to risk; and (iv) time preference.

Design standards typically play the greatest role in how water systems are planned. It is common, for example, not to produce several designs but just one in the belief that adherence to standards will result in the best design. Also, it is expensive to produce several designs. Most professionals believe that standards have evolved from the screening of numerous alternatives and represent best practice. Design standards typically recommend periods of excess capacity ranging from 10 years or so for treatment plants and pumping stations up to 50 years for pipe networks and sewers. It is automatically assumed that such excess capacity is optimal without considering alternative designs with different amounts of excess capacity.

The task of *Appropriate Design* is to question standards and practices, especially those that derive from the industrialized countries. Standards might be based on trials, but seldom are those trials in the developing countries where they are being applied. The kinds of questions that *Appropriate Design* tries to answer include:

- How much excess capacity is optimal?
- What per capita flow rates are likely for the town whose system is being designed?
- Could temporary facilities that might need to be replaced after a few years be better than more permanent facilities designed to last for decades?
- What levels of service should be considered for a town?
- Is mechanization and instrumentation that is optimal for industrialized countries also appropriate for towns?
- Why might a town feel second class if its new system does not use the standards of industrialized countries?

Economies of scale exist when average cost decreases as scale or capacity increases. Economies are common for most of the products we buy such as clothing and food... it is “cheaper” to buy the giant economy size, not because total cost is lower, but because cost per unit (average cost) is lower. Economies of scale apply to most components of water systems. If a water treatment plant with capacity X costs 100, a plant with capacity $2X$ costs less than 200. Economies of scale prompt us to buy more than we need. Instead of buying a single bar of soap, we buy a package with two or three bars; instead of designing a water plant to meet today’s demand, we provide excess capacity to meet demands that may not to be realized for decades.

The example in Section 2 shows that larger is not necessarily better. Whether excess capacity is optimal depends on the amount and timing of demand: the numbers of users that will connect to the piped network when it is first placed in service; rates of user connections in subsequent years; and per capita consumption. Furthermore, while individual components of water systems tend to have economies of scale, they may be modest or lacking for entire water systems because of the diseconomy of having to

extend network piping – the most expensive component – to dispersed users. This topic is treated at greater length in Section 7. The point here is that excess capacity must not be automatically assumed but treated with an attitude of skepticism; alternative designs without excess capacity need to be considered as well as ones that include it.

Most planners are risk averse and fear the consequences of shortages. It is normal to feel that a water system is a failure if all the people that it is intended for cannot be served. Also, once planners, politicians, donors and project stakeholders are engaged for planning – often bringing substantial subsidies – it is logical to overbuild in order to: (i) delay as long as possible the need for planning and building an expansion; and (ii) avoid the risk of not being able to assemble the team, get the financing, and secure the required agreements in the future when an expansion is needed. But the risk of a shortage and the need for an early expansion depend on demand, which is an unknown state of nature. Hence, designers need to weigh consequences of different designs more carefully and not automatically assume that shortages will occur and that disasters will result by not providing much excess capacity.

4. States of Nature

The example in Section 2 shows that selection of the best design depends not only on having alternative designs, but also on states of nature. System design can be reasonably certain, but states of nature can be highly uncertain. The example suggests that the states of nature of concern to town water supply pertain mostly to demand. While only two different states of nature (i.e. levels of demand) were assumed for the example, in practice there are usually many, all of which are uncertain. This section focuses on what is meant by “demand” and different ways of estimating it.

The meaning of “demand” in this paper is the technical sense used in economics. It pertains to customers using an improved water system and taking quantities of water based on their willingness to pay. So, the first aspect of demand is how many households will connect to and use the improved system. The second is how much water the users will purchase. This notion of “demand” can be contrasted with the more common notion of “water requirements,” where it is assumed that most households will connect to an improved system because it is so much better than their present arrangement, and they will use a certain amount of water because they “need” it.

It is important to distinguish between demand in the short term and in the longer term. The financial viability of water systems depends on having customers with connections in the short term. If a new water system is to develop into a sustainable business, it needs connected customers as soon as it is placed in service. This implies that the first task of planning is to tailor the basic capacity of the system to the number of users who will connect to it upon completion of its construction. Our example assumed that many households had already solved their water problem by having wells. The question of demand, then, is how many of them will be willing to switch to the new system. Even some households without their own water sources may be unwilling to connect to the new system, especially if the cost for them is too high. These are some of the critical questions pertaining to states of nature that must be assessed for the short term.

Demand in the long term – i.e. the numbers of new connections and the amounts of water they will buy over time – is mainly relevant for the planning of excess capacity in improved water systems (excess not beyond the present population but beyond the number of users when the system is first placed in service). While it is difficult to estimate demand in the short term, it is even more difficult for the longer term, which typically makes the provision of excess capacity a risky venture.

The task of estimating states of nature is twofold: (i) What are the demands? (ii) What are the probabilities that they will occur? Three ways are commonly used to estimate demands: supposition, expert opinion, and surveys. Supposition is probably used the most and is usually optimistic (some would say precautionary). Recall the comments about economies of scale in Section 3. Economy of scale derives mostly from sharing the cost of setting up a project across a larger investment/ return. Driving to a grocery store, or moving large equipment onto a construction site, or investing heavily up-front in the planning process, all create economies of scale. The set-up effort in turn implies optimistic expectations: no one wants to think after investing so much at the outset that the project will be unsuccessful. Although future water use from an improved system is uncertain, the tendency is to assume that it will materialize as predicted. Optimistic expectations strengthen the incentive to overbuild and provide too much capacity. The issue for Appropriate Design is whether such optimistic suppositions are justified.

Expert opinions often play a large role in estimating demands. Such opinions, however, are most valuable when based on evidence and relevant experience. The opinion of a foreign designer about what demands might materialize may be worth little if the expert is unfamiliar with the town that is to get the improved system. Opinions about demands in other countries and other towns may contribute little to the successful design of this particular town's water system. Most estimates of long-term demand for the towns of developing countries are pure conjecture.

Population data for the planned service region are certainly necessary, but they are usually not sufficient for making accurate estimates of demand. For demand estimation in the short term, opinions – and preferably data – are needed on the number of households that have and do not have their own private water supply. Equally importantly, levels of satisfaction with present supplies influence whether a household with its own supply will switch to a new system. Levels of income are also strong predictors for demand estimation. Households without their own water sources may not connect to and use improved systems because they are too expensive. Other aspects about which expert opinions are needed in order to assess the levels and likelihood of demand are: household attitudes toward government ownership and operation of the improved system; whether government is to be trusted and has a reliable track record of serving the community; and, if operation is to be outsourced to a management company, the likelihood of that company sincerely caring about and serving the town.

A survey is one of the most reliable ways to predict states of nature. Increasingly, household willingness-to-pay surveys are a requirement for water supply planning,

especially for large expensive projects. If properly conducted, they can provide information on both the numbers of customers who will use the improved system when it is placed in service and on the amounts of water that the users will purchase. What surveys cannot do, however, is make accurate predictions of long-term demand. Surveys are cross-sectional, made at one point in time, a snapshot, and to make long term extrapolations from them is risky. It follows that including substantial excess capacity in town water systems is a risky business.

To summarize some of the key points in this section about states of nature:

- The unknown states of nature associated with town water supplies pertain to demand
- Lack of knowledge about states of nature makes water planning an exercise in decision making under uncertainty
- Demand has two aspects: willingness to pay for a connection to the pipe network; and willingness to pay for water from the network and estimating states of nature (demand) needs to focus on both aspects
- Demand needs to be considered in the short term (when the new system is first placed in service) and also in the longer term
- The viability of the town water system depends mainly on demand in the short term
- If revenues from users in the short term don't cover costs (because demand has been misjudged), the system probably won't survive, meaning the "long term" may never arrive
- Because of uncertainty in long-term demands, provision of excess capacity much beyond the first few years after commissioning should be avoided
- Three ways are used to estimate demands (states of nature): supposition, expert opinion, and surveys
- Supposition, the most common method, should never play a serious or major role in town water supply planning
- Expert opinion should consider such things as: present population, numbers of households with private water sources, satisfaction with present water sources, income (as a surrogate for willingness to pay for both connections, and quantities of water), and the likelihood of successful management and operation
- Surveys are always desirable and should be used as much as possible, especially for systems that are expensive.

5. Payoff Matrix

The example in Section 2 shows that the Payoff Matrix can be helpful in the Appropriate Design of town water systems. The question is: what parameters should be used for it? The example used annual net revenue, which is a way of addressing the financial viability and sustainability of the water utility. But the example is naive because net revenue changes from year to year, and the year for the example was not reported. At the heart of this problem is the fact that town water systems have long useful lives that can provide social benefits for many decades after they are placed in service. Consequently, costs,

revenues, and social benefits come in streams over time. The Payoff Matrix, however, requires a single value upon which selection of the most appropriate design can be based.

Table entries in the Payoff Matrix should be for a criterion that relates to the objective of choosing the best design. It would be possible, for example, to report the net present value (NPV) of social benefits, i.e. present value benefits less present value costs summed over the life of the project. Such a criterion would recognize the fact that water systems have long useful lives, and it would attempt to capture performance over their lifetimes. However, NPV is a criterion that relates more to the overall economic worth of a project; it is typically used to justify whether a project should ever be built in the first place (do its benefits to society outweigh its costs?) or, in capital budgeting cases, whether a particular project is preferable to others given that scarce resources do not permit construction of all. These questions have presumably been answered by the time town water systems are under design and are not relevant to the question of which design is best.

This paper argues that sustainability, financial viability, and financial self sufficiency are the main concerns in planning town water systems. It argues further that viability in the short term is key. If the new system does not get off to a solid start, especially with its revenues covering its costs, then it will be at risk, and the long-term may never materialize. Hence, NPV, economic internal rate of return, and financial internal rate of return are inappropriate criteria for selecting the best design.

This argues for a measure in the Payoff Matrix that focuses on financial viability in the first few years after the new project comes on line. Net revenue (used in the example), or its counterpart net cost, are appropriate criteria. They need not be for a single year but could cover the first few years of operation after commissioning. To assess net revenue, estimates are needed of the rates at which household connections will be made when the system is first started, the amounts of water that are likely to be sold, and the prices that will be charged, all of which are needed for preparation of a well-designed system.

6. Criteria for Decision Making

The final element in the decision model of this paper pertains to how the information in the Payoff Matrix should be used for selecting the best design. The example presented two approaches for decision making: the conservative Maximin criterion in cases where states of nature are completely unknown; and Expected Payoff in cases where probability estimates (even very rough ones) can be associated with the different states of nature. The technical literature in this field is huge, and it is not our purpose to summarize it. Decision trees have been used for dealing with uncertainty for about forty years, and more recently Monte Carlo simulation has played an increasingly important role. Expected Payoff or some version of it generally works well.

For some readers, probability judgments like these may be new and different from the conventional approaches that have been applied for many decades. The goal is not to ask planners to generate six different designs and estimate twelve different levels of demand,

including their likelihood, but rather to be aware that Appropriate Design requires consideration of:

- alternative designs not based strictly on standards);
- estimates of demand not based on supposition but rather on the likelihood that households will connect to and buy water from the new system; and
- financial self sufficiency (revenues covering costs), especially in the short term.

Some town water systems will be completely new, in places where piped water did not previously exist; some will be upgrades, extensions, and expansions of existing piped systems that may not be working properly; and some may be add-ons to towns on the periphery of larger community water systems, either with a poorly functioning system or none at all. The approach to decision making in most cases needs to be tailored to the specific situation: one size does not necessarily fit all.

Systems that are new or without a recent history of effective operation present the greatest challenge in predicting their uncertain demands. In many of those cases, planners will have little choice but to use something like the Maximin criterion for decision making, because the likelihood of different states of nature (demands) is not just *uncertain*, when it would be possible to associate probability estimates with different demands, but *unknown* – a matter of almost pure conjecture. This is due to the lack of credible evidence about how many households will connect to the new system and how much water they will buy, which in the absence of historical data on performance can only be obtained from proper household surveys. Answers to those questions, which provide a basis for predicting revenues – essential information for the Payoff Matrix – depend among other things on the effectiveness of system management and operation. Without a management system in place, planners can do little more than guess.

For these towns without recent data or survey findings on the demand for water from an improved piped system, it would be unwise to provide excess capacity beyond present users because of the uncertainty of demands beyond the short term. If planners base designs on the expectation of new connections which then don't materialize, the sustainability of the project is at risk, and it may fail. On the other hand, if no excess capacity is provided but new connections do materialize in the future, then the growth in demand makes the project even more a "success," and users will have indicated their willingness to pay for an expansion.

	<i>Without Excess Capacity</i>	<i>With Excess Capacity</i>
<i>Connections Don't Materialize</i>	Success	Can't Take Remedial Action
<i>Connections Materialize</i>	Take Remedial Action	Success

Consider the above chart: if the system is designed *Without Excess Capacity* and new connections *Don't Materialize*, then the actual situation matches the expectations of design, which makes the project a success. Similarly, if the project is designed *With Excess Capacity* and new *Connections Materialize*, reality matches predictions, again yielding success. It's the off-diagonal boxes that pose problems. If the system is designed *Without Excess Capacity* but *Connections Materialize*, then remedial action is called for,

viz. capacity expansion. However, if the system is designed *With Excess Capacity* but *Connections Don't Materialize*, no easy remedial action can be taken. The burden of paying for the over-designed system falls on relatively few customers who may not be able to cover costs to keep it operating. Thus, designing *With Excess Capacity* poses the risk of a greater disaster than designing *Without Excess Capacity*.

The risks of future water demand not materializing are well known and there is literature on how to deal with the problem. Nearly 40 years ago, Warford (1966), formerly of the World Bank, argued that water systems should not be expanded until users send an appropriate signal by their willingness to pay a price equal to the long run marginal cost of water production. More recently, the World Bank Water Demand Research Team (1993) argued that new infrastructure should be provided only when beneficiaries are willing to pay for it but not before.²

The argument not to provide excess capacity rests on the lack of confidence regarding future demands beyond the short term. In cases where an existing piped system is in place and households are using it, the level of confidence about demands is usually much higher, which can justify provision of some excess capacity, but probably not too much. The decision about how much should depend on how convincing the case is that future demands will materialize. To the extent that the case is made by conjecture rather than evidence, the amount of excess capacity should be negligible.

7. Modular Approach to Design

Water and sewer systems, like other public infrastructure, consist of components that are assembled into a working whole. The designer must decide how much capacity to include in each component so that the system can both meet immediate demands that present users are willing to pay for, and be compatible for expansions that future users are willing to pay for when longer term demands are indicated.

Consider the express highways of Europe and America. When they are first constructed, the highway itself may initially have only a few lanes, say four. Bridges, however, are usually designed with more lanes, six or eight, and the extra go unused until the highway is expanded. Now consider the fenced right-of-way. It is typically very wide, with sufficient capacity to accommodate several expansions, the last of which may not be made for many decades. So, the entire system has a different amount of excess capacity for each component. The situation is similar for water and sewer systems. The objective of this section is to see what determines the optimal excess capacity for each component and how those determinants affect the design.

² Warford, J. J. (1966). "Water Supply," in *Public Enterprise*, by R. Turvey (ed), Penguin Books, Baltimore, 1968. World Bank Water Demand Research Team (1993). "The Demand for Water in Rural Areas: Determinants and Policy Implications," *World Bank Research Observer*. vol 8, no 1 Jan 1993. Also, see Saunders, R. S, and J. J. Warford ((1976) *Village Water Supply: Economics and Policy in the Developing World*, Johns Hopkins.

Factors that influence the optimal excess capacity include, but are not necessarily limited to: (i) demand in the short term when the system is first placed in operation; (ii) future growth in demand over the longer term; (iii) useful economic life; (iv) compatibility; (v) technology change; (vi) reliability; (vii) preemption risk; (viii) opportunity cost and (ix) economies of scale. The roles these factors play are briefly discussed in the following paragraphs. The crucial issue of economies of scale is considered at more length at the end of this Section.

Short Term Demand

Short term demand is discussed above in the section on states of nature. Demand has the economic connotation of willingness to pay. The minimum amount of capacity to provide upon project completion for all components depends on the service that consumers want and are willing to pay for. Since short term demand dictates the basic capacity of the entire system, it needs to be estimated with a high level of confidence.

Longer Term Demand

Longer-term demand is also discussed in the section on states of nature. It is a major determinant of excess capacity in the initial project, but it is not the only determinant. This paper argues that because longer-term demand is usually uncertain, the amount of excess capacity provided at the outset for most components should be modest, probably not more than a few years of estimated demand growth.

Useful Economic Life

Different elements of a water system have different economic lives. Consider pumping stations. Their concrete structures typically have useful lives of 20 years or more. Pumps, controllers, and other mechanical equipment usually need replacement much sooner, which argues for less excess capacity in equipment than in structures.

Compatibility

Most designers are aware of compatibility issues, but they may not always take them into account, especially if their experience is in industrialized countries where equipment replacement is relatively easy and future demands are highly likely. Recall the highway example: it would be foolish to build bridges with four lanes and highways with six; the capacity of bridges and highways must be compatible. Similarly, it does not make sense to use 20-year design periods for water treatment plants when the mechanical equipment that must be installed in them has a much shorter useful life. Most designers are aware of compatibility issues, but they may not always take them into account, especially if their experience is in industrialized countries where equipment replacement is relatively easy and future demands are highly likely.

Technology Change

The useful life of a computer is only a few years, not because it will fail mechanically, but because the technology is changing so rapidly. Although the technology of water and sewer systems changes more slowly than computers, it does change; improvements are continuously being made in pumps, chemical feeders, flocculators, and methods of construction. Moreover, as developing countries industrialize and items that formerly had

to be imported are manufactured locally, it is all the more desirable to limit the amount of excess capacity in components.

Reliability

Suppose water supply is from wells. If long term future demand is uncertain, it would be unwise to construct extra wells with capacity to meet it, mainly because there are no economies of scale in building additional wells. However, some extra capacity is needed just to meet short term demands because wells fail and periodically need to be taken out of service. Similarly, treatment plants need extra flow capacity to provide for maintenance and failure, just as water distribution networks usually need extra pipes to close loops to provide reliability in case of breaks. The arguments for excess capacity in elevated storage tanks and other units without mechanical equipment are less compelling.

Preemption Risk

This applies mostly to land acquisition. Highway rights-of-way are wide in order to ensure that land will be available in the future for capacity expansions should they prove necessary. Probably the most compelling case for excess capacity in any component pertains to land acquisition.

Opportunity Cost

Opportunity cost is one of the most compelling issues for limiting the amount of excess capacity in water and sewer facilities. If a system has capacity to meet demands that may not materialize for ten years or more, the scarce resources invested in it provide no benefit to society for at least that length of time. The cost of tying up scarce resources unproductively has consequences for other social improvement projects that are foregone such as schools, hospitals, electric power and telecommunications. For most developing countries, the opportunity costs (typically measured by the discount rate) of excess capacity are very high, which argues for using short design periods.

Economies of Scale

Because planners are aware that economies exist in water and sewer systems, they commonly believe it is their duty to capture them in their designs. This paper argues that a necessary condition for providing excess capacity is that future demands need to be predicted with confidence. It can easily be shown, however, that even if long-term future demands are absolutely certain, excess capacity should not be provided if economies of scale are lacking.³ Hence, future demands are a necessary but not a sufficient basis for justifying excess capacity. This section examines the extent to which economies of scale exist in water system components.

The capital costs of water system components are typically estimated by equations of the form:

$$\text{Cost} = \alpha (Z)^{\text{beta}}$$

³ See, e.g., Lauria, D. T. et al. (1977) *Models for capacity planning of water systems*, J. Environmental Engineering, vol. 103, no. EE2, pp 273-291.

where alpha and beta are parameters with different numerical values for each component, and Z is a measure of the capacity of the component such as the flow it can deliver (for treatment plants and pump stations) or volume (for storage tanks and reservoirs). Economies of scale exist if beta is between 0 and 1; for $\beta \geq 1$, there are no economies of scale.⁴ The smaller the value of beta, the larger are the economies of scale. If future demands are highly likely, then projects with large economies of scale (small beta) should have more excess capacity than those with small economies of scale (large beta); however, no excess capacity is warranted if $\beta \geq 1$.

The following cost functions for components of piped water systems are from the *1999 Drinking Water Infrastructure Needs Survey: Modeling the Cost of Infrastructure* by the US Environmental Protection Agency.⁵ Alpha is a constant that largely takes account of economic conditions in the US including units of currency, and the value of beta is probably not much different in developing countries than in the US. The following table lists the values of alpha and beta for the major components of piped water systems; it also shows the units in which Z must be expressed (MLD= million liters per day, ML= million liters).

Component	alpha	beta	Z
Wells	190,908	0.67	MLD
Raw Water Intakes	137,551	0.55	MLD
Disinfection Facilities	23,440	0.68	MLD
Water Filtration Plants	850,432	0.70	MLD
Elevated Storage Tanks	599,919	0.67	ML
Ground Storage Tanks	390,760	0.69	ML
Pumping Stations	193,223	0.64	MLD
Pipe per meter of length	13	1.20	inch
Private Household Connections (from West Africa)	150	1.00	each
Public Fountains (from West Africa)	800	1.00	each
Contingencies as % of total capital cost	10	--	--
Land + Engineering as % of capital + contingency cost	10	--	--

Note that according to the table, water intakes have the largest economies of scale (beta = 0.55); most other components have beta values between 0.64 and 0.70. However, if diameter in the pipe cost function were replaced by flow capacity using an empirical flow equation, beta would be 0.5-0.6, making the economy of scale similar for pipes and intakes, i.e. there is considerable economy of scale. There is usually little or no economy with respect to pipe length; i.e. the average cost per unit length of pipe of given diameter usually does not decrease as the total length of pipe in the network increases. The situation is similar for wells: economies exist for enlarging the diameter of a well but not for adding more wells.

⁴ Beta is the ratio of marginal to average cost. If $\beta < 1$, then marginal cost is $<$ average cost, which means that average cost decreases as capacity increases because it is pulled down by lower marginal cost. Only projects with decreasing average costs have economies of scale.

⁵ See: www.epa.gov/safewater/needs/.

The above cost functions were used to estimate the cost of entire water systems with different design capacities; the cost estimations are shown in Annex A2.1 and summarized in the chart below:

Average Household (HH) Size	7
Average Water Usage by HH w/ Connections, LCD	60
Average Water Usage by HH w/ Public Fountains, LCD	20
Unaccounted For Water, %	30
Max Daily/Average Demand for HH w/ Connections	1.6
Max Daily/Average Demand for HH w/ Public Fountains	3.0
Average Pipe Length for HH w/ connects, meters/capita ⁶	1.0 -2.0
Average Pipe Length for HH w/ Public Fountains	0.5 – 1.0
Average Pipe Diameter, inches	3 - 7
Distribution Storage, cubic meters/capita	0.016

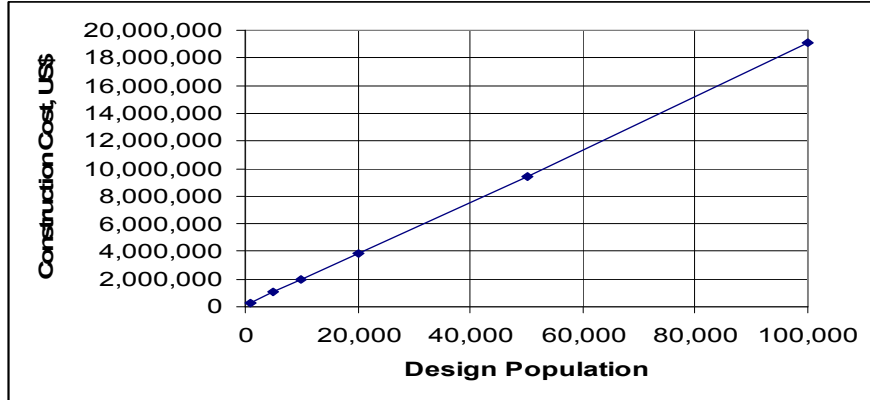
A regression model was fitted to the total cost estimates (US\$) of systems with design populations from 1,000 to 100,000 that use private connections; the result is

$$\text{Cost} = 382 * [\text{Design Population}]^{0.93}$$

The exponent close to 1 indicates only small economies of scale for entire water systems despite the fact that some individual components have substantial economies of scale.⁷ This is because they are offset by the diseconomy of having to extend the pipe network to serve households that are dispersed: the length of pipe in a network, which is the main determinant of its cost (not pipe diameter), increases in proportion to the number of connections it serves. Note in the breakdown of illustrative costs in Annex A2.1 that the pipe network accounts for about 60% of total project cost. The network might in fact account for a larger fraction of total system cost, and the exponent in the above equation would be >1, if average length per connection were 26 meters as in the US instead of 7-14 meters used for the examples.

⁶ Papers by Bank staff and others report network pipe length of 1-2 meters/capita, which for the examples herein translates to 7-14 meters/connection. A random sample of 44 cities and towns in North Carolina has 26 meters/connection on average, with very high correlation (0.98) over a range of connections from 100 to 164,000.

⁷ Population in the equation is a surrogate for capacity.



Such small economy of scale argues that even if long-term future demands were known with certainty, it would not be economically optimal to include much excess capacity in the total system, although some individual components might be provided with excess capacity. The question for the rest of this section is how to design the components of water systems so that they can be readily expanded when future demands manifest themselves.

The following table divides the components of water and sewer systems into three categories, depending on the recommended amount of excess capacity: > 5 years, about 5 years, and less than 5 years. The rationales for each component are given below

Component	Explanatory Factors	
<i>Provide Large Excess Capacity, > 5 years</i>		
Land	Preemptive Risk	
Reservoirs	Preemptive Risk	Economy of Scale
Water Intakes	Preemptive Risk	Economy of Scale
Sewers	Compatibility	Economy of Scale
<i>Provide Some Excess Capacity, ~ 5 years</i>		
Wells	Economy of Scale	Reliability
Network Diameters	Economy of Scale	Reliability
Pump Stations	Economy of Scale	Reliability
Treatment Plants	Economy of Scale	Reliability
<i>Provide Little or No Excess Capacity, < 5 years</i>		
Network Length	Future Demands	Economy of Scale
Storage Tanks	Future Demands	Economy of Scale

Land Sufficient land needs to be purchased at the outset to allow future expansions should they prove necessary; otherwise, the risk is run that the land will be preempted and unavailable when needed in the future.

Reservoirs They typically consume large amounts of land and have large economies of scale, both of which tend to argue for including substantial excess capacity, even if long-term demand is somewhat uncertain. However, the relatively high cost of reservoirs always makes it necessary to carefully justify their excess capacity.

Water Intakes Data from US EPA show that their economies of scale are among the highest. Also, there may be preemptive risk if they are not built at the outset with more than a little excess capacity.

Sewers Their economies of scale (with respect to diameter, not length) are among the highest of all components (higher than water networks) and, because they must be laid on grade, it is difficult to obtain compatible expansions in the future. Also, by the time sewers are needed, there should be little uncertainty about future demand, so they should typically have more excess capacity than other components.

Wells They have two aspects for design: the number to be constructed, and their diameters. Economies of scale are generally lacking with respect to number; like pipes in networks, the average cost per unit depth of well construction does not decrease as more wells are built. However, there are economies with respect to flow capacity, i.e. building wells of larger diameter to extract more flow. Moreover, like the other components in this category for which modest excess capacity is recommended, they are dependent on mechanical equipment that can fail and thus face problems of reliability.

Pipe Network Diameters Water pipes laid underground have fairly high economies of scale with respect to their flow capacity. Trench excavation, backfilling, traffic control, and paving costs hardly vary with pipe diameter, making the marginal cost of increasing diameter to provide excess flow capacity modest. Furthermore, the flows in networks are uncertain, so to provide reliability, design diameters may need to be enlarged.

Pump Stations & Treatment Plants They need modest excess capacity for reliability, given their dependence on mechanical equipment. Moreover, their economies of scale are fairly substantial, especially components constructed below ground.

Network Length There is usually no economy of scale associated with building longer networks ahead of demand; in addition, the location of future demand is uncertain, which argues for not providing any extra length in the network.

Storage Tanks Economies of scale are modest and it is difficult to know where future demands will be located, making it hard to decide where in a network to provide excess capacity in storage tanks. It is usually preferable to wait and see where the tanks are needed.

8. Concluding Comments

Town water supply planning and design is an exercise in decision making under uncertainty. The conventional approach of providing several years of excess capacity in systems based on design standards from industrialized countries is inappropriate. Designers need to have two factors uppermost in mind when deciding water systems: (i) what will be the demand for capacity when the improved system is first placed in service; and (ii) how will the demand change over time, keeping in mind that demand implies willingness to pay. Answers to these questions must be based on firm evidence, not on

supposition or guess. Because longer-term future demand is usually uncertain, excess capacity beyond that needed to serve present users when the improved system is first placed in service cannot be justified. Even if growth in demand is absolutely certain, no excess capacity should be provided in some components of water systems because there are no economies of scale. In no case should design periods be as long as those used in industrialized countries because the opportunity cost of tying up scarce capital resources unproductively in excess capacity is always high in developing countries. Sustainability of the water utility rests on financial self sufficiency, which requires system cost to be matched to users' willingness to pay.

Annex A2.1 Cost estimations used in regression analysis

Population	1,000	5,000	10,000	20,000	50,000	100,000	%
Avg Production, MLD	0.09	0.43	0.86	1.71	4.29	8.57	
Source Works, US\$	50,435	148,266	235,902	375,337	693,491	1,103,395	5
Treatment	6,071	18,136	29,056	46,552	86,803	139,071	1
Storage	37,571	110,449	175,733	279,604	516,610	821,964	4
Pipe Network	97,419	492,066	996,255	2,039,000	5,407,514	11,609,390	62
Connections	21,429	107,143	214,286	428,571	1,071,429	2,142,857	11
Contingencies	21,292	87,606	165,123	316,906	777,585	1,581,668	8
Land+Engineering	23,422	96,367	181,635	348,597	855,343	1,739,834	9
Total Cost, US\$	257,638	1,060,032	1,997,989	3,834,567	9,408,774	19,138,179	100
Cost/ML	824	678	639	613	601	612	

**Town Water Supply
and Sanitation Services
Volume 3**

The Case for Household Connections

Companion Paper A3

**Donald Lauria, North Carolina University
September 2003**

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Companion Paper A3: The Case for Household Connections

Donald Lauria, North Carolina University

September 2003

1. Importance of household connections

Household connections are essential to the viability and sustainability of town water systems. Just as telephone companies could not survive if they depended primarily on public pay phones, so too households with private connections are the life blood of town water companies. Connections are all the more important because water utilities need to be financially self sufficient if they are to provide service on a continuously sustainable basis. Financial and other assistance from donors and governments is available at the outset as a form of venture capital to get water utilities launched. After that, town water systems are mostly on their own to become successful businesses. At the root of success is the need to treat water utilities as commercial enterprises and the product they sell as a commercial good.

If water supply were mainly a social good, with guaranteed on-going financial assistance to keep the enterprise afloat, then connections might be less important; water could be distributed to customers mainly through public standposts without concern about generating enough revenue to cover costs. But once financial self-sufficiency is seen as the basis for sustainability, the utility has to have formal ties to committed users who pay on a continuing basis for the service they receive. Connections are the means of delivering water to them.

The IMF's *Finance and Development* (June 2003) and *World Economic Outlook* (April 2003) describe the role of effective institutions in development.¹ The focus is broadly on governmental institutions, but the principles also apply to water utilities. Among the prerequisites for an effective institution is protection of property rights, which, for water utilities, is obtained through metered connections.

2. Piped water systems

System Capacity

The basic capacity provided in town water systems when they are first constructed needs to be tailored to the size of the market. Just as a new hotel would not be constructed with 1,000 rooms in a small town nor a restaurant be opened with enough tables for all families in the community, the capacity of the water system needs to be matched with the number of customers who are likely to use it. In particular, capacity to serve the entire existing population would usually be too large because households typically have several options of where to obtain water. The case for progressive expansion to meet real rather than guesstimated demand is explained in detail in the accompanying Companion Paper A2: *Appropriate design of town water systems*, by the same author.

¹ See: <http://www.imf.org/external/pubs/ft/weo/2003/01/index.htm>

Public Standposts

In cities of developing countries, it is common to provide improved water systems with public standposts for households without private connections. The main reasons for this are that: (i) cities are reluctant to extend pipe networks into areas where households do not have tenure, but standposts located in nearby (formal) neighborhoods provide squatters with a source of water; and (ii) when a squatter area is formalized (restructured), permitting its residents to buy their land and for water to be extended into their neighborhood, standposts are provided as an interim solution for those who cannot yet afford a connection.

However, standposts pose problems and this paper argues that they should be avoided if alternative solutions are possible. Standposts are never a permanent part of piped water systems, so any costs incurred in providing them do not contribute to long-term benefits. Standposts are usually spaced far apart, requiring users to walk long distances to fetch water, which limits consumption and requires home water storage that is often unsafe.

The most successful standposts are metered, have attendants, and charge users for each container of water. However, attendants are expensive and their cost frequently drives the price of water from standposts above that paid by households with connections, even if the water provided to standposts is subsidized (see *Consumption, prices and costs*, later). Also, if standposts are widely spaced, each can become a monopoly able to charge a high price because of no nearby competitors. Assigning standposts to attendants (concessionaires) for operation has potential for corruption because standposts can be lucrative sources of revenue.

The capital cost of delivering water through standposts may not be much different from delivery through private connections, but the benefits are significantly lower; in fact, the cost *per cubic meter* delivered may well be higher with a standpost system than one with private connections.

Consider a town with an average of seven persons per household. Assume that if the entire population is served by connections, average consumption is 60 liters/capita/day (lcd) but if only standposts are used, average consumption is 20 lcd. Assume that unaccounted-for water is 30%, that source works, storage, and pipes must be designed for a peak-to-average ratio that is about twice as high for a system with standposts as for one with connections, and that connection systems require twice the length of pipe compared with standpost systems. The first table shows estimates of construction cost for towns of different size, assuming wells are the source of supply, only disinfection is needed for treatment, and all customers have private connections. The second table assumes service is only by public standposts. Cost functions for both tables are mostly from the US Environmental Protection Agency (see Annex 1); they pertain to the US and are probably too high for developing countries. However, while the values in the bottom rows of the two tables may not apply to any particular country, the conclusion from this analysis that cost per cubic meter is probably no less for a standpost system than for one with private connections is probably accurate for most developing countries.

Estimated Project Costs (Connections Only)

Population	1,000	5,000	10,000	20,000	50,000	100,000	%
Avg Production, MLD	0.09	0.43	0.86	1.71	4.29	8.57	
Source Works, US\$	50,435	148,266	235,902	375,337	693,491	1,103,395	5
Treatment	6,071	18,136	29,056	46,552	86,803	139,071	1
Storage	37,571	110,449	175,733	279,604	516,610	821,964	4
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Connections	21,429	107,143	214,286	428,571	1,071,429	2,142,857	11
Contingencies	21,292	87,606	165,123	316,906	777,585	1,581,668	8
Land+Engineering	23,422	96,367	181,635	348,597	855,343	1,739,834	9
Total Cost, US\$	257,638	1,060,032	1,997,989	3,834,567	9,408,774	19,138,179	100
Cost/ML	824	678	639	613	601	612	

Estimated Project Costs (Standposts Only)

Population	1,000	5,000	10,000	20,000	50,000	100,000	%
Avg Production, MLD	0.03	0.14	0.29	0.57	1.43	2.86	
Source Works, US\$	36,810	108,213	172,175	273,943	506,152	805,324	7
Treatment	4,410	13,174	21,107	33,817	63,057	101,026	1
Storage	37,571	110,449	175,733	279,604	516,610	821,964	7
Pipe Network	48,709	246,033	498,127	1,019,500	2,703,757	5,804,695	63
Public Fountains	4,000	20,000	40,000	80,000	200,000	400,000	4
Contingencies	13,150	49,787	90,714	168,686	398,958	793,301	8
Land+Engineering	14,465	54,766	99,786	185,555	438,853	872,631	9
Total Cost, US\$	159,116	602,423	1,097,643	2,041,106	4,827,386	9,598,941	100
Cost/ML	1526	1155	1053	979	926	920	

Cost per million liters (ML) decreases as population increases due to economies of scale; for any design population, cost/ML is higher for a standpost system than for a system with connections. This is because standpost systems need to be designed for higher peaking factors than systems with only connections. The following regression equation was fitted to the costs for systems that have only connections

$$\text{Construction Cost} = 3.37 [\text{Finished Water Production, MLD}]^{0.93}$$

where cost is in US\$ and Finished Water is total production less unaccounted-for water, i.e. the (net) amount available for sale. The exponent value being only slightly below 1.0 indicates small economies of scale.

Using Neighbors

Where will households that cannot afford connections get their water? One way is to get it from neighbors. Many developing countries prohibit households with connections from selling to neighbors without them. The main reason is that if connections do not have meters (for instance when consumers pay a flat rate tariff), or if meters are not read, or if

bills are not based on consumption, or if service is not discontinued for non-payment of bills, households with connections will reap the revenue from selling to neighbors, and the water company will never get it. This invariably leads to demands that exceed system capacity, with deterioration of service and eventual collapse of the water company.

Water companies operated on a commercial basis will not face these problems. If all customers have meters, if the meters are read, if bills are rendered for the amount consumed, and if the service of customers who are in arrears paying their bills is cut and not reinstated until a reconnection fee has been paid, then the water company will be paid for all the water it sells. This is the type of autonomous water company needed in the towns of developing countries, the type intended by these notes.

Making water available from neighbors has several advantages. If households with connections can sell water, neighbors without them will have more and closer sources than if they had to use standposts. That makes their supplies more reliable and the carrying burden less. Also, the proximity of multiple sources eliminates the possibility of spatial monopolies and strengthens competition, thereby improving service and lowering prices. With no need for attendants, prices from neighbors should be lower than from standposts, and the potential for corruption in awarding standposts to concessionaires is eliminated. With shorter carrying distances, it is possible that consumption might be higher than from standposts, thereby improving health. Rendering bills to standposts would be eliminated, and a clear message would be sent that connections are the preferred means of service, prompting households to get them sooner than if standposts were available.

An increasing block tariff (IBT) would pose a problem in buying from neighbors, just as it does for apartment houses and other customers where a single meter is used by more than one household: potentially large use can push total consumption into a higher block of the tariff for which a higher price is charged. IBTs should be avoided where neighbor-to-neighbor water sales are part of the connection policy.

Shared Connections

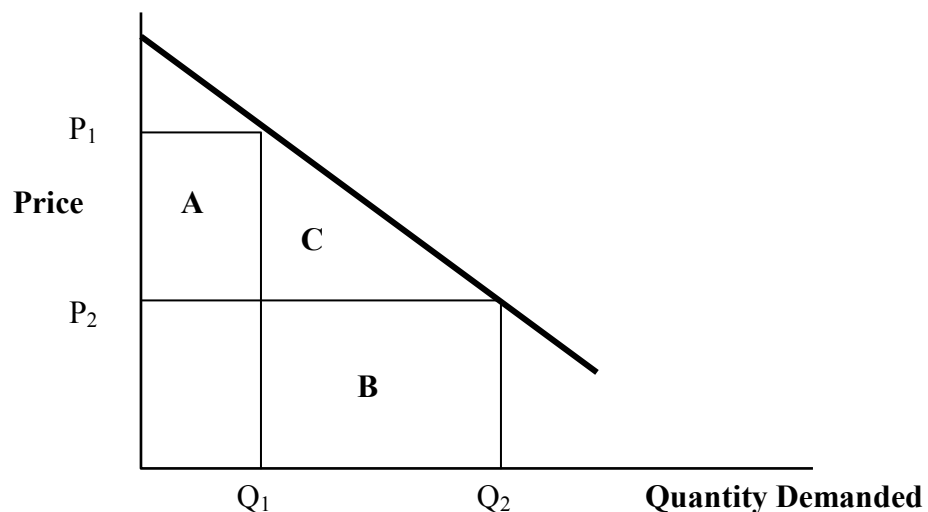
Another way to serve households that cannot afford their own private connection is through shared connections; e.g. households might be allowed to organize themselves into small groups so as to share a connection and meter. This arrangement has a few more potential problems than simply buying from neighbors. The increasing block tariff problem would still exist. In addition, presumably only one household would be responsible to the utility for paying the bill, an arrangement that would have to be worked out among the users. The possibility of a participating household leaving the community or selling its house makes this arrangement a little more risky than using neighbors. However, shared connections can be more secure and possibly less expensive than buying from neighbors.

Bulk Supply

A variation on shared connections is to allow large groups of households, e.g. subdivisions, satellite communities, and defined neighborhoods, to organize themselves into neighborhood water districts for purchasing bulk supply from the town water utility. Such districts might be able to manage their own systems, including construction, water distribution and billing, but there are risks that their facilities and management systems could fail, adversely affecting the town supplier. Other risks are that construction might be of poor quality, or excessive prices might be charged. However, once water is treated as a commercial good, a wide array of arrangements becomes possible and different methods for giving consumers choice merit consideration. For this alternative, the town supplier would need to be able to handle the risks of bulk sales to neighborhood water districts, presumably limiting this option to larger cities and towns.

Benefits of Private Connections

Households that were previously using standposts, neighbors or vendors but who switch to private connections after an improved water system is built usually pay a lower price for water after switching, and they increase their consumption. Assume the price paid before switching was P_1 and the quantity consumed was Q_1 ; P_2 is the (lower) price after switching and Q_2 is the (higher) quantity. The demand curve below illustrates the benefits of switching to a private connection. Area A represents the monetary savings on the amount that was consumed prior to switching; Area B represents the amount paid by the household as a result of increasing its consumption from Q_1 to Q_2 ; and Area C is the consumer's surplus on the increased consumption. Taken together, $A + B + C$ is the economic benefit of a private connection. It is usually an underestimation of benefits however, because households that switch reap additional benefits of not having to fetch water (time and energy savings) and of lowering risks to health.



Total benefits for the town water system are greater than the sum of individual household benefits. A reliable water supply eliminates the need for households to provide back-up (coping) facilities in case of failure; it saves them time and money; it improves health and

worker productivity, reduces the risks of disease, promotes community growth and development, and makes overall improvements in the quality of life.

Consumption, Prices & Costs

Compared with the alternatives such as trucks, animals, carts, humans, etc, a piped system has the lowest real cost per cubic meter for delivering water. Households that get their water from neighbors, vendors, or other sources are effectively paying a higher price (not necessarily in monetary terms) than if they had a connection.

The first reason why some households don't connect to piped systems when they have the chance is because of the up-front connection cost and security deposit. The second reason is cash flow. Senegal, for example, sends water bills once every two months, and Cote d'Ivoire sends them once every three months. Poor households cannot budget for such lumpy payments, but many can pay an equivalent amount on a daily basis. The third reason is because of difficulty in controlling water use. It is easy to open a faucet but difficult to limit the amount of water taken from it. Households are at constant risk of using more water than they can afford.

The table below shows data on consumption, prices and costs from four different household surveys in Africa conducted during 1996-2001. Not all data are from randomly drawn samples, which means that they may not be typical, but they do represent correct orders of magnitude. Data from Abidjan were from only one neighborhood, and data from Rwanda were only for rural households that got all their water from point sources such as standposts. The water systems in Dakar and Abidjan are well run and financially self sufficient, and the one in Niamey is nearly so. Except for Rwanda, standposts had paid attendants. Row 2 of the table shows the percentage of the households using the source in row 0. Rows 3 and 4 show average household and per capita consumption, and rows 5 and 6 show average water prices and amounts paid. Rows 7-13 show the cumulative distribution of consumption. For example, 5% of the households with connections in Niamey consume less than 11 m³ per month, 50% use less than 28 m³, and 90% use less than 58 m³.

	Niamey, Niger			Dakar, Senegal			Abidjan	Rwanda	
0 Main Source	Connect	Standp	Vend	Connect	Standp	Vend	Connect	Standp	
1 Avg. Persons/Household (HH)	11	10	11	9	6	6	9	5	
2 % of HH with Indicated Service	44	14	32	65	26	2	--	99	
3 Avg Consumption, m ³ /mo/HH	32	10	12	13	4	3	11	2	
4 Avg Consumption, lcd	98	33	35	50	20	18	40	13	
5 Avg Price, US\$/m ³	0.3	0.6	1.5	0.7	1.6	2.6	0.4	0	
6 Avg Cost, US\$/capita per yr	11	7	20	12	12	17	6	0	
	Cumulative %			cubic meters/month per household					
7	5%	11	2	2	--	--	--	2	1
8	10%	15	2	2	--	--	--	2	1
9	25%	23	3	4	8	2	--	3	1
10	50%	28	5	5	11	4	--	7	2
11	75%	46	6	7	16	5	--	14	2

12	90%	58	9	8	--	--	--	23	3
13	95%	72	10	10	--	--	--	36	4

Row 5 shows that water prices from vendors were higher than from standposts, which in turn were higher than from connections; this is fairly typical where standposts have attendants. Row 4 shows some variation in per capita consumption: in Dakar and Abidjan, it is 40-50 lcd for houses with connections, but in Niger it is twice as high, possibly because the price is lower and the tariff is less well enforced; Dakar and Abidjan are typical of well run water companies. Consumption from standposts and vendors is about 15-20 lcd except in Niger where it is unusually high. Row 10 shows median consumption, which for households in Abidjan with connections is not much higher than that of point source users in Niamey. If water consumption is correlated with income, then the values in row 9 (lowest 25% of consumption) may represent an upper bound on the usage of poor households; e.g. poor households with connections in Dakar and Abidjan probably consume not more than 8 and 3 m³ per month, respectively.

3. Deciding the System

User Preferences

A central task in planning town water systems is to determine the numbers of customers who want private connections and the amounts of money they are willing to pay for them each year. This implies participatory planning and giving customers voice in decision making. It also means that planners should not make guesses about connections, the amount of capacity to provide in new and improved systems, and revenues; they need a solid basis for making estimates and forecasts – data obtained from surveys, not hunches. The data should come from a sample of customers that represents the entire community. If user fees are low, more households will want connections than if they are high. Hence, surveys need to obtain information over a range of possible user fees. To a lesser extent, similar information is needed about the numbers that do not want and will not connect to an improved water system (in order to have confidence about the capacity that it is estimated should be included).

With information about the numbers of households that want connections and the annual amounts they will pay for them, a decision can be made about whether the community can afford an improved water system that offers connections to its customers.

Different methods can be used to get information about numbers of users and the annual amounts they will pay. They include focus groups, household surveys, and analysis of existing water markets. Educated guesses (e.g. that all households will pay 3% of their income each year for a private connection) have performed badly and are not recommended. The rest of this paper assumes that contingent valuation (CV) household surveys are the means used to obtain the required information for planning.

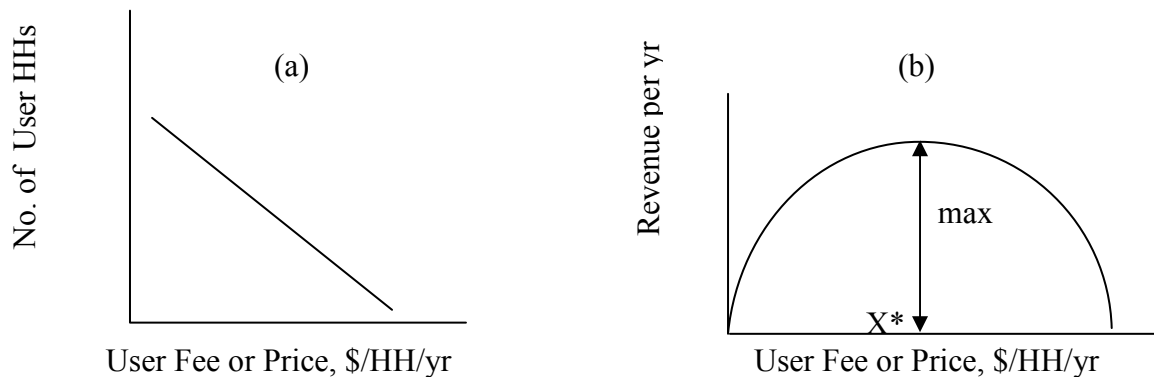
Predicting Capacity and Affordability

In a medium-sized town, a CV study typically surveys 500-1000 randomly selected households. Interviewers use a questionnaire to get information on each respondent's

preferences for water improvements, their present water and sanitation practices, whether they are willing to pay a specified amount each month (or other billing period) for a specific type of water improvement (the CV question), and socio-economic information about the household. For example, a subset of sample respondents might be asked in the CV question whether their household would be willing to pay the equivalent of US\$ 10 each month for a house connection that provides twice as much water as they presently use; the respondent would be told that the water would be safe to drink and available 24 hours a day. Other subsets of the sample would be asked the same question but with different monthly fees. They would be told that the more they consume, the more they would have to pay, and if they decided not to have a connection, their neighbors would be authorized to sell them water, or they could use other sources such as wells or rivers.

As proposed connection costs become more expensive, a smaller fraction of households is willing to pay for them. Responses from the sample of households result in a demand function for connections like the one shown in Fig (a). If the sample is properly drawn, it represents the entire town. Hence, values on the vertical axis are obtained by multiplying the fraction of households (HH) that says *yes* to a connection at each different fee by the town's design population. If the monthly fee were zero, essentially all households would want a connection, but at some very high fee, no household wants one. The information in Fig (a) is key to decisions about system capacity.

The potential annual revenue resulting from different monthly fees looks like the curve in Fig (b), which is obtained by multiplying the number of user households for different fees in (a) by the fees themselves; the fees are converted to equivalent annual values.



The maximum revenue per year in (b) is obtained by charging a fee of X^* per household per yr (or per month). If that revenue is insufficient to cover the annual cost of a system that offers house connections, then it cannot be provided. If the survey reveals insufficient willingness to pay for house connections, the reason may be that respondents do not fully understand the benefits of them, or they might not believe that an improved system could be well implemented and operated, or many households may have constructed their own wells and be satisfied with their present water situation, or there may be other reasons. If the planners are convinced that the reason for rejecting a house

connection system is lack of understanding by respondents (assuming the CV study was well executed and got accurate information), then a public education campaign could be launched to better inform townspeople about the benefits of connections. This would be followed by another CV study to reassess willingness to pay. Such campaigns are necessary only in rare cases.

If maximum revenue in Fig (b) is more than enough to cover the total annual cost of a system that offers connections, then the fee charged to users can be lower than X^* , which means that more households (higher coverage) can be served with connections. It is common to choose the lowest user fee per household in order to maximize the number of households using connections and still cover total annual costs (including profit if the system operator is a private company). This fee derives from the average cost of water production.

Community input on household willingness to pay is only part of what is required for planning a town water system. Their input is also needed on:

- Which neighborhoods should initially be served with the improved system?
- Where, when, and what criteria should be used for making future network extensions?
- How are decisions about connections to be handled? Should subsidized social connections be provided? What are the eligibility rules for getting one?
- What should the tariff be and how should it be enforced?
- What should the rules be for selling water to neighbors without connections?

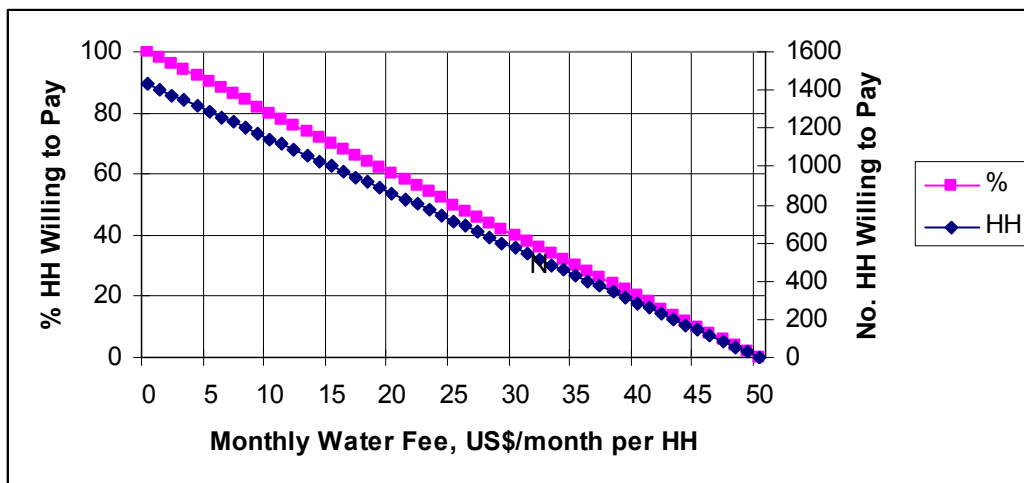
An Example

Consider a town with a present population of 10,000; with an average of seven persons per household, it has 1430 households. If population grows by 50 households/ year (~3%), after 20 years the town will have 2430 households (17,000 persons). We start by assuming that 60% of present households (860) would connect to the network of an improved water system and that their average consumption would be 60 lcd; we will refine the assumption about connections later using the results of a CV survey. The water company would sell 0.36 million liters/day (MLD) to households with connections; if the other 40% buy from neighbors and consume 20 lcd on average, they would use 0.08 MLD, making total water sales 0.44 MLD, 82% to connected and 18% to unconnected households.

Let's assume that after 20 years, all households in the town would be connected and would use 60 lcd on average. Hence, water sales then would be about 1.00 MLD. Because the increase of 0.56 MLD is uncertain, it would be unwise to design the entire system for 1.00 MLD at the outset; a more conservative approach is to design for 0.44 MLD plus some fraction of the increase, say 25% (0.14 MLD), which might provide excess capacity for about 5 years. Thus, it is proposed that the system be designed for water sales of 0.58 MLD, which requires total production of 0.83 MLD to take account of 30% unaccounted-for water (UFW).

The estimated capital cost of this system would be about US\$ 2 million. Assume that the town can get a 40-yr loan to build this system at 5% interest; the capital recovery factor is 0.058 per year, resulting in annual debt service payments of about US\$ 119,000. We assume that a grant is not available and that the water company has to repay the loan for the entire capital cost. In addition to debt service, revenues from water sales must cover annual operating and maintenance (O&M) costs, which are estimated to be about US\$ 51,000.² Hence, total annual revenue would have to be about US\$ 170,000. This estimate does not provide any funds for making future capital improvements to the system such as extensions into new neighborhoods, or for making new future household connections, or for profit if a private operator is engaged; these issues are addressed below. It also ignores contingencies. It does, however, assume that the cost of connecting the initial 860 user households to the network is part of the loan.

The first question is whether the maximum willingness to pay of the entire community is at least US\$ 170,000 per year. If not, then the proposed system is not feasible. Suppose that a household CV study of a random sample of households were conducted and 80% of the respondents said they would be willing to pay US\$ 10 per month (US\$ 120/yr). We can assume that 100% of the households would want a connection if it were free. With these results, and assuming that the demand function is a straight line like the one in Fig (a), we can (roughly) predict the % of households (P) that would use the improved water system for any monthly user fee (X) that the company decides to charge; the equation is $P = 100 - 2X$. For a fee above US\$50/month per household (choke price), no one would use the system ($P=0$), and for a fee of, say, US\$ 20/month, about 60% would pay for a connection ($P=60$). The graph of demand for connections is



The fee for which revenue is maximum is one-half the choke price when the demand function is a straight line, in this case US\$ 25/month. The demand function predicts that 50% of the households (715 of them) would pay this amount, resulting in total revenue of

² Annual O&M is estimated for this example to be about 1% of total capital cost (US\$20,000) plus US\$ 0.1 per cubic meter of water produced (US\$31,000) for a total of about US\$ 51,000.

about US\$ 18,000 per month or US\$ 215,000 per year. Clearly, the proposed system with estimated annual cost of US\$ 170,000 is affordable.

Using the CV results, we can check the assumption that 60% would initially connect to the network. The fraction of total sales to households with connections is 82%, which is the fraction of total annual cost for which they are responsible, US\$ 140,000. With 860 connected households, their average user fee would be US\$ 13.50/ month. From the demand function in the above chart, 73% of the study households said they would pay this amount. Hence, the initial assumption that only 60% would connect is too low and needs to be revised upwards.

Reworking the analysis assuming that 70% (1000) of the present households would initially connect, the proposed capacity of the system is a little larger than before. It increases from 0.58 to 0.62 MLD; capital cost increases to US\$ 2.15 M; required total annual revenue increases to US\$ 178,000; and the average user fee decreases from US\$ 13.5 to US\$ 13.0, which is the amount that 74% of study households said they would be willing to pay. Thus the assumed fraction agrees well with the predicted fraction of households that want connections; the proposed capacity for finished water is 0.62 MLD.

The task now is to convert the monthly fee into an equivalent price for water. The most conservative approach is to ignore water sales to households without connections. With average consumption of 60 lcd and 1000 households with connections, estimated annual sales would be 153,000 m³ and the average price would have to be about US\$ 1.16 per m³. By taking account of the revenue from the 430 households without connections who would buy from their neighbors at 20 lcd, the price drops to US\$ 1.0 per m³.

4. Financial Viability

When water is treated as a commercial good, the main objective in operating a water system is to maximize the satisfaction of customers with private connections. This means making water available to them in ample quantity, quality and reliability to the extent they are willing to pay for it. It also means generating sufficient revenues to cover costs, keeping the cost to consumers with connections as low as possible, enforcing the tariff, keeping the system in good operating condition, rendering bills on a timely basis, responding to complaints, and giving voice to customers regarding system operation.

Tariffs typically need to cover: operating, maintenance and replacement costs; debt service on existing facilities; payments to a fund for making capital improvements, including connections; a surcharge to maintain a balance against uncertainty; and profit if the operator is from the private sector. Customers should have the opportunity to provide input to tariff decisions at public meetings; they should be told and understand that tariffs typically need to increase each year.

It is usually desirable for tariffs to include both a fixed monthly charge and a commodity charge based on the amount of consumption. The fixed charge guarantees basic revenue regardless of water sales, and it should cover at least part of the fixed costs. In the example, the entire debt service plus some of the O&M cost is fixed. The proposal to

recover costs entirely through a commodity charge would be risky because it would produce no guaranteed income to cover fixed costs. An alternative tariff design would be to recover some fraction of cost from a fixed monthly charge, say US\$ 7/ month per customer; the resulting average price that would have to be charged for consumption would then be about US\$ 0.54 per m³. This tariff would essentially guarantee base annual revenue of US\$ 84,000 regardless of sales assuming that the predicted 1000 households connect to the network.

The frequency of rendering bills is a major determinant of: (i) the demand for house connections; (ii) the amount consumed; and (iii) system sustainability. Most households cannot easily pay large bills that arrive infrequently. Monthly billing should be the norm even if it incurs higher cost to the water company than billing every 2-3 months. It may not be necessary to read meters for each billing if estimates can be made that are periodically adjusted by meter readings

Until the 1980s, water was treated mainly as a social good, with large (external) subsidies from governments. For the next two decades, it was recognized mainly as a commercial good, with small or no subsidies and the need for users to pay all or most of the costs. Recently, water has been acknowledged as both a social and a commercial good, and subsidies for the poor are again under consideration. Three ways are commonly used to subsidize the poor: (i) by letting households without connections buy from neighbors or other water resellers; (ii) by providing a lifeline rate in tariffs for customers with connections; and (iii) by subsidizing household connection costs. With all three methods, internal subsidy from wealthy water users to the poor is the goal, with little or no external subsidy.

A lifeline rate for households with connections implies an increasing block tariff (IBT), with a low price for the first block aimed at subsidizing a minimum amount of basic needs consumption for the poor. Based on the data from Niger and Cote d'Ivoire, the size of the first block could be about 3, no more than 5, m³ per month. However, an IBT will not help the poor if they are large water users, as in Niamey; a lifeline rate meets its objective of cross subsidizing the poor by the wealthy only if household consumption is correlated with household income. Unfortunately, few data are available on the extent to which such correlations exist, especially in towns where a large fraction of the population might qualify as poor. Consequently, the author's conclusion is that it is not appropriate to use IBTs for towns in developing countries.

5. Marketing & Paying For Connections

Once it is found that a house connection system is affordable, then marketing of connections to households is the key to success of the water enterprise. Marketing must be given high priority, and impediments to making connections should be minimized.

The greatest single impediment to having a house connection is usually its up-front cost, including the security deposit. Most utilities are unwilling to waive the security deposit for new customers because it is unknown whether they will reliably pay their future water bills, but nine different schemes for charging customers for their connections are

summarized in the following table, some of which are aimed at cross subsidizing the poor.

	Up-Front	Debt	Up-Front + Debt
All Customers Pay Full Cost	1	2	3
None Pays Full Cost	4	5	6
Some Pay Full Others Pay Part or Nothing	7	8	9

In the first row, all customers pay the full cost of their connections; in the second row, no customer pays full cost, all connections are subsidized; the bottom row is a combination where some customers pay full cost and others are subsidized.

In the first column, all customers pay the connection cost up-front in cash; in the second column, all customers finance their connections by paying for them over time; in the third column, some customers pay up-front and others finance over time.

Senegal and Cote d'Ivoire in West Africa have successful aggressive programs for marketing household connections. Both countries have lease-operate contracts with concessionaires who are remunerated on the basis of the amount of water sold. Hence, the concessionaires (and governments) are anxious to make connections so as to increase water sales. These countries have made connections at very high rates, which has ensured the financial viability of the water systems.

Commercial, industrial, institutional, and wealthy residential customers pay the entire connection cost up-front in cash. Poor residential customers can apply for a social connection, in which case they pay the security deposit and a small fraction of the connection cost up-front. The remainder of the connection cost is paid from either loan funds in the case of Senegal (debt financing), or a special revolving fund in the case of Cote d'Ivoire. Hence, these countries use the scheme in cell 9 of the matrix.

Cote d'Ivoire does not use loan funds for financing social connections. Instead, its water tariff includes a surcharge that generates funds for this purpose. The surcharge is a progressive tax, high for large water users and low for small users. Hence, payments to this revolving fund are similar to debt financing. The size of the tax must be large enough to finance the social connections that are approved each year but not so large as to exceed the capacity of water supply and distribution facilities; social connections must keep pace with expansion of the pipe network. This is the most likely arrangement for towns in developing countries.

Once primary and secondary water mains have been targeted for extension into a neighborhood, households that immediately want a connection can pay for the street main to be extended to their property, in which case they pay the entire cost up-front, including main extension, house lateral, meter, and security deposit. Alternatively, households wanting an immediate connection can join with nearby dwellings in petitioning for an extension and sharing its cost. These households are presumably not poor and therefore not eligible for a social connection in Senegal and Cote d'Ivoire.

Households not willing to pay for a main extension must wait until construction of the street main has reached their property. If certain criteria are met, such as the main is within 20 meters of the property, the owner is not wealthy, and she has title to both land and dwelling, she can petition for a “social connection” for which most of the lateral and meter cost is subsidized, either from loan funds in Senegal or the revolving fund in Cote d’Ivoire. Towns would have to decide whether they want to restrict extensions and private connections only to neighborhoods where residents own their houses and land; the need for ownership may be less compelling in towns than in cities.

The water companies in Senegal and Cote d’Ivoire require written applications for social connections. Field inspections are made of each request before granting it. Once approved, the household pays a nominal fee and security deposit for its connection. About 90% of the residential connections in Cote d’Ivoire and 70% in Senegal are social connections. Marketing social connections needs to guard against awarding them to households that cannot afford to make regular water payments.

Cell 8 in the matrix provides for all connections to be financed, with no up-front payments. The initial connections that are made when the system is first constructed would presumably be included in the project. For future connections as well as network extensions and other capital improvements, the most likely source would be a special revolving fund like the one in Cote d’Ivoire. In the example, with a single block tariff that does not include a fixed monthly charge, the average water price would be US\$ 1.00 per m³; a fixed charge of US\$ 7 per month would cut the price to US\$ 0.54 per m³. To this tariff should be added surcharges for making capital improvements including network extensions, and for connecting future customers to the network. Suppose these items increase target revenue from US\$ 178,000 to US\$ 203,000 per year. This additional revenue of US\$ 25,000 could be generated by including two surcharges, one of 7% for making connections and another of 7% to cover capital improvements. Taken together, the 2 surcharges would increase the single-block commodity price from US\$ 1.00 to US\$ 1.14 per m³; alternatively, in a two-part tariff, it could be split between the fixed charge and the commodity price. The higher price to cover financing of connections and extensions would lower the initial number of households connecting to the system. It is important to keep these two revenue sources separate so that funds generated by them do not leak away for other uses.

Cell 7 in the matrix provides no financing of connections through the water company. This however does not preclude households from borrowing from private lenders (banks, etc.) and arranging their own financing. Where lending markets are weak, the scheme in cell 7 is an obvious impediment to house connections and probably would not work well in towns.

If the policy in the third row (cells 7, 8, and 9) has been adopted to subsidize the poor, social connections should not be given to households that can afford to pay. Two ways to guard against this are: (i) careful screening of applicants before approving social connections; or (ii) requiring water consumption not to exceed a certain amount each

billing period, otherwise service will be cut and households will have to pay the entire connection cost to have it restored.

The schemes in cells 4, 5, and 6 provide subsidies for all. The philosophy is similar to that of lifeline rates, which make a certain amount of subsidized water available to all. The main advantage is that a reduced-cost connection is readily available to all customers, accelerating the rate of connections, though the subsidies presumably would not cover the extension of street mains to houses in order to provide “rapid” connections. Another advantage could be reduction of the administrative costs incurred in screening households to determine which are eligible for subsidized connections and which are not. The main disadvantage is that connection costs are recovered through monthly water consumption bills, making them higher and posing increased risks to cost recovery should households default on their bills and have their connections cut.

The schemes in cells 1, 2, and 3 provide no subsidies for connections. The economic rationale for this is that water supply is primarily a private good, similar to TV sets and telephone receivers, and therefore consumers are responsible for paying full costs. It can be argued that not only does piped water supply not provide substantial positive externalities to society, but there are negative spillovers in the form of wastewater, especially if water consumption is high, which should not be encouraged by subsidies. This kind of economic rationale, however accurate, does not promote the sustainability of town water systems.

Annex 1 Capital Cost Functions

The following cost functions for components of piped water systems are from the *1999 Drinking Water Infrastructure Needs Survey: Modeling the Cost of Infrastructure* by the US Environmental Protection Agency (www.epa.gov/safewater/needs/). All functions have the form:

$$\text{Cost} = \alpha Z^{\beta}$$

where Cost is in 1999 US\$, Z is the determinant of cost such as the volume of storage tanks in million liters (ML) and flow capacity of treatment plants in ML per day (MLD), α is a constant that largely takes account of economic conditions in the US including units of currency, and β is a constant that is probably not much different in developing countries than in the US. Thus it is argued that the form of the cost function is the same in developing countries as in the US, the values of β are about the same, and the main difference is in α . The following table lists the values of α and β for the major components of piped water systems; it also shows the units in which Z must be expressed (MLD= million liters per day, ML= million liters). Note that economies of scale exist for components whose values of β are less than 1.0.

Component	α	β	Z
Wells	190,908	0.67	MLD
Raw Water Intakes	137,551	0.55	MLD
Disinfection Facilities	23,440	0.68	MLD
Water Filtration Plants	850,432	0.70	MLD
Elevated Storage Tanks	599,919	0.67	ML
Ground Storage Tanks	390,760	0.69	ML
Pumping Stations	193,223	0.64	MLD
Pipe 1-meter long	13	1.20	inch
Private Household Connections*	150	1.00	each
Public Fountains*	800	1.00	each
Contingencies as % of cost subtotal	10	%	
Land + Engineering as % of cost subtotal	10	%	

* Data are from West Africa

The following major assumptions underlie the estimated costs in the tables in Section 2:

Average Household (HH) Size	7
Average Water Usage by HH w/ Connections, LCD	60
Average Water Usage by HH w/ Public Fountains, LCD	20
Unaccounted For Water, %	30
Max Daily/Average Demand for HH w/ Connections	1.6
Max Daily/Average Demand for HH w/ Public Fountains	3.0
Average Pipe Length for HH w/ connects, meters/capita	1.0 -2.0
Average Pipe Length for HH w/ Public Fountains	0.5 – 1.0
Average Pipe Diameter, inches	3 - 7
Distribution Storage, cubic meters/capita	0.016

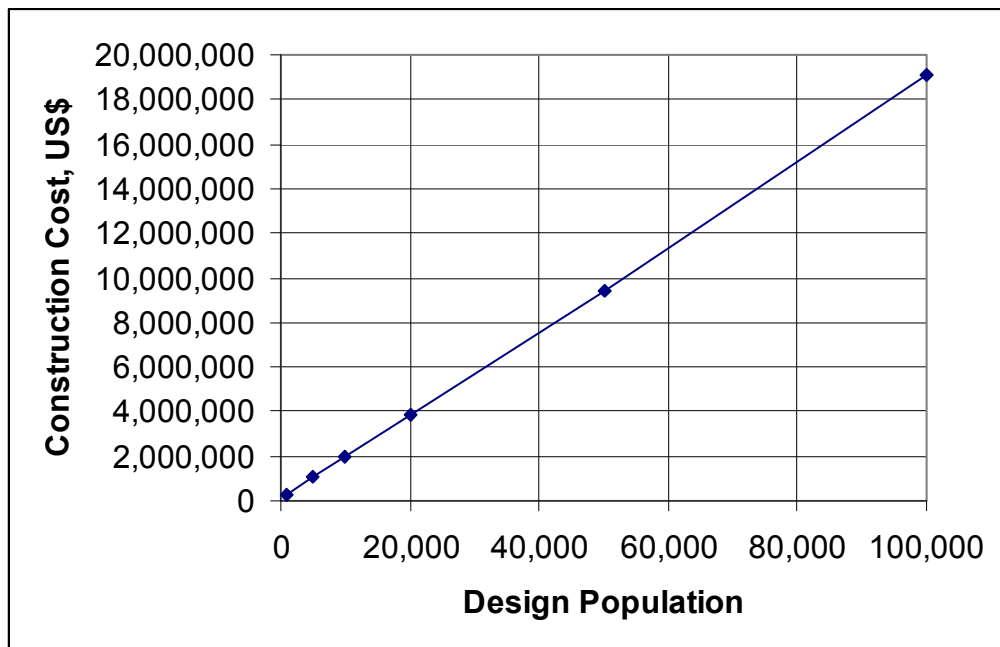
Regression models were fitted to the total cost estimates (US\$) of systems with design populations from 10,000 to 100,000 that only use private connections; the results are

$$\text{Cost} = 382 * [\text{Design Population}]^{0.93} \quad (\text{A1})$$

$$\text{Cost} = 3.37 [\text{Finished Water Production, MLD}]^{0.93} \quad (\text{A2})$$

$$\text{Cost} = 58,000 + 190 * [\text{Design Population}] \quad (\text{A3})$$

All models fit the data very well and produce similar cost estimates. The exponent of A1 and A2 close to 1 indicates only small economies of scale, which is also reflected by the relatively small intercept in A3. Equation A3 indicates a set-up cost of only US\$ 58,000, which is a small fraction of total costs; the coefficient in A3 suggests marginal construction cost of only US\$ 200 per capita. The graph of A1 is below



**Town Water Supply and
Sanitation Services
Volume 3**

Management and Operation Functions

Companion Paper A4

**Barry Walton & Colin Schoon
July 2003**

The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and should not be attributed in any manner to the World Bank, to its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent.

Companion Paper A4: Management and Operation Functions

Barry Walton & Colin Schoon

July 2003

1 Overview

The purpose of this paper is to identify the key managerial and operational functions involved in running a water utility serving from 5,000 to 200,000 people. In well-off societies, conurbations in this range have utility-managed services and external support in terms of financial cross subsidy, an accessible knowledge base, goods, services and construction. Our context, though, is the serving of relatively poor populations. While self help and shared effort should improve services and moderate the hardship suffered by small communities, there is no elixir of adequate services to be provided within a low-cost envelope. Simple aggregation of communities without the input of money and effort at an operational level from the better-off, is unlikely to deliver services that are not inherently precarious and poorly controlled.

To give some scale to the issues, a simple town range model in *Excel* is annexed. We are talking about conurbations in the range of perhaps 1,000 dwellings (5,000 population) to 50,000 dwellings (200,000 population), tens to hundreds of kilometers of mains and supply pipes, large surface areas, some of which will be paved, and simple to complex supply, delivery, treatment and storage works. There is likely to be, even at the low end of the scale, continual day-to-day activity in operations, maintenance, repair and replacement of assets and in dealing with connected and potential customers. New connections and infrastructure expansion will demand planning, economics, financing, design and construction effort.

The discussion considers three general sizes of town with corresponding levels of complexity and organizational frameworks involving a local operator with outreach support or use of a full service operator. It is however not easy to define points at which organizations change. Motivation responds to more than change in population served. At the end of the paper some case summaries are given of settlements within the range. They indicate that:

- At the threshold of 5,000, populations, physical and administrative systems may already be complex. The need to manage assets and money means that rudimentary skill alone will not be sufficient and external operational support is necessary in all areas. Practically, it is possible that there may be a sufficient skill level within the community to manage a simple system, but it will have to be tapped. In some situations, cooperatives have been successful in mobilizing customers who are suitably qualified to provide input.
- Before the served population reaches 100,000, all recognizable functions of a large business will be evident and will be shared among a core of professionals, administrators, artisans and support staff. Specialist activity will typically be outsourced.
- Even at the top end of the scale, when a separate autonomous entity with wide in-house skill is normal, its success requires access to sector knowledge, goods and services.
- Simple aggregation is unlikely to deliver satisfactory services. There is little point in increasing a revenue base unless economies of scale are rigorously mobilized to finance common needs. An enforceable umbrella agreement between collaborating parties is an essential

There is a sobering point from the England and Wales water and sewerage privatization experience. The 1989 Water Act made specific that, with respect to charges “ . . . the interests

of customers and potential customers in rural areas are so protected”. Implicit in that was the understanding that small outlying communities were not viable as stand-alone entities.

There is an issue of transition. At what points do passive systems – or indeed self-help systems – require consolidation and management? At what points do activities require dedicated input? What triggers the appreciation of need for normal engineering over domestic arrangements? When do the collection, use and accounting for money become matters requiring specialist input and safeguards? There is the initial move from personally provided to supplied services. There are other moves triggered by general growth and change in the dependent customer base combined with asset creation and operational activity.

Throughout the population ranges under consideration, it can be argued that, in some form or other, collective effort through a managed service will be needed. Even if they are apparently simple and carried out by staff who turn their hands to many tasks, all the work elements of a comprehensive organization could be present even for a town of 5,000 people. Long before we reach populations of 200,000 and tens of thousands of connections, all elements of management and operations functions will be necessary. Changes will reflect a move from rudimentary and contingent operations to more secure ones with increasingly rigorous standards. For example, a gravity system built with external funds and requiring no direct payment from those using it, no quality testing and little pressure or leakage management requires virtually no effort to run it. It may survive for many years or even decades without anything untoward happening. Such an idyllic situation can be expected to be rare, water abundance and natural good quality being a magnet for population growth.

Adding some in-system storage, operational maintenance, pumping, metering and a charging system, generates a need for competent people to carry out at least day-to-day activities. There will be an immediate demand for an operator, a system inspector and meter reader, an accounts clerk, some support staff and labor. If, as matters of policy (and of course to promulgate that policy, there will have to be decision makers and management), water quality is to be monitored, water is to be disinfected, settled and controlled and costs and revenue managed then further scientific, economic and accounting input will be required. The growth in effort is not just a consequence population served, but of the nature of the assets and the management of risk. Whether those who carry out the tasks are full-time, part-time, shared or hired as necessary should be the outcome of an efficiency study on a case-by-case basis. Mobile plant, equipment, transport, spares and consumables also come into the equation. Services such as meter reading, billing and customer contact will have to be carried out. They are all amenable to in-house and outsourced arrangements. They can be in a general department (engineering, billing, plant maintenance, etc.) of a wider organization such as a Municipal Authority, part of a larger water sector service provider, (resources, treatment, leak detection, etc) or contracted out.

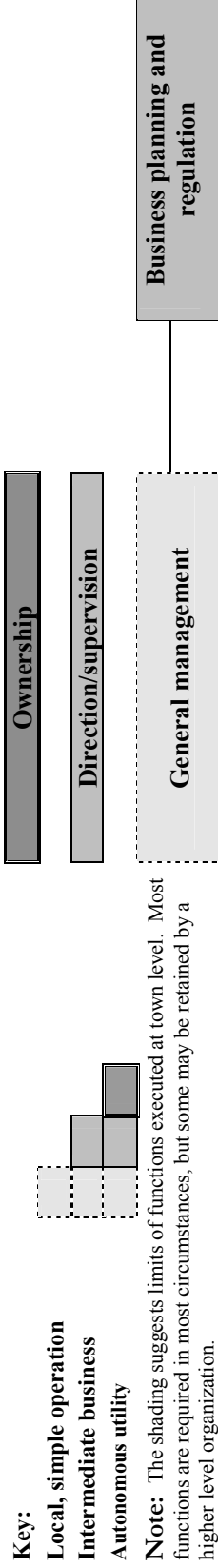
2 Town WSS functions

Table A4.1 provides a summary of functions arranged in a typical organizational format. Activities have been color-coded at the following horizons.

- Local simple operations
- Intermediate business
- Fully comprehensive

The exercise shows that functions overlap. It also confirms that descriptors apply at even the simplest levels of activity and ignoring them in the hope of producing an affordable service is doomed to fail.

Table A4.1 – Town WSS functions



Key:

Local, simple operation

Intermediate business

Autonomous utility

Note: The shading suggests limits of functions executed at town level. Most functions are required in most circumstances, but some may be retained by a higher level organization.

Water and wastewater supply, distribution, collection, treatment		Commercial	Customer services	Personnel (HR)	Financial	Capital works
Operations	Wastewater treatment systems	Meter reading, billings and collections	Complaints handling	Payroll operation	Management (internal) accounts	Implementation of minor works
Surface water resource systems	Sludge disposal	Stores procurement and stock control	Liaison with interest groups	Welfare, safety and discipline	Use of revenue finance	Asset replacement planning
Groundwater resource systems	Emergency planning	Maintenance of current accounts (bookkeeping)	Customer information material	Recruitment	Asset inventory and valuation	System expansion planning
Simple filtration and dosing works	Maintenance	Pursuit of bad debts and illegal connections	Liaison with NGOs, CBOs, SHGs, ISPs	Contract labor deployment	Corporate accounts	Demand forecasting
Simple distribution systems	Mechanical and electrical equipment routine maintenance	Services contract management	Public relations	Design of remuneration and benefits structures	Capital accounts	Design solutions
Public supply points	Burst mains repair	Customer contracts	Education programs	Appraisal systems	External finance	Assessment of new technology
New customer connections	Equipment servicing and parts replacement	Customer database	Research on willingness and ability to pay	Incentive systems		Procurement methods
Buildings and systems, vehicles and plant	Leakage detection and reduction	Applications for permits and way/leaves	Research on acceptable service standards	Training administration		Capital works supervision
Water and waste quality monitoring	Civil and building works maintenance	Capital and supply contract design				Program management
Treatment works, storage works and trunk mains maintenance	Vehicles and plant maintenance	Financing agreements				
Network distribution systems, reservoirs and pumping plants	Workshop activities	Adherence to sector, commercial, consumer and employment law				
Wastewater collection systems	Long-term maintenance planning					

3 Influences on functions and support

3.1 Town size and growth

Using some simple ratios, based on experience, suggests 2 to 3 senior staff members (manager, engineer, accountant) at the minimum size operation, through to at least 10 at the 200,000 population level. Total numbers of people involved (senior staff as well as junior technical and administrative staff, pump operators and labour) would be much larger, for example an organization serving a population of 100,000 could be expected to have 100 to 200 employees, (see Table A4.4 in section 3.4 below). In any event, staff to customer ratios must be treated with care as bought in activity includes embedded human effort. The extent of outsourcing opportunities will affect the ability to contain long-term staff employment and consequent semi-fixed cost. Non-mechanised construction and maintenance activities will mean relatively high head counts. Table A4.2 illustrates the gradation of the applications of skills to functions across the size range, using the Customer Services function as an example (a more comprehensive set of tables is given at the end of the paper Tables A4.2a-A4.2e).

Table A4.2 – Typical application of skill levels to functions with changing town size (example for Customer Services function)

Key: periodic continuous

Skill type	Skills level	Town population range		
		2,000 to 20,000	20,000 to 50,000	50,000 to 200,000
specialist	Policy-and supervisory	<input type="checkbox"/> Tariff policy <input type="checkbox"/> Performance supervision	<input type="checkbox"/> Tariff policy <input type="checkbox"/> Performance supervision <input type="checkbox"/> Connections policy	<input type="checkbox"/> Tariff changes <input type="checkbox"/> Performance supervision <input type="checkbox"/> Connections policy <input type="checkbox"/> Customer group liaison and regulatory reporting
	Professional (management of routine tasks and development and implementation of enhancements)	<input type="checkbox"/> Performance management <input type="checkbox"/> Tariff review <input type="checkbox"/> Internal audit	<input type="checkbox"/> Performance management <input type="checkbox"/> Tariff review <input type="checkbox"/> Internal audit <input type="checkbox"/> Customer information and contracts <input type="checkbox"/> Services contracts <input type="checkbox"/> Current accounts <input type="checkbox"/> IT systems	<input type="checkbox"/> Tariff review <input type="checkbox"/> Services contracts <input type="checkbox"/> IT systems <input type="checkbox"/> Contract and agreements design <input checked="" type="checkbox"/> Performance management <input checked="" type="checkbox"/> Current accounts <input checked="" type="checkbox"/> Stores procurement <input checked="" type="checkbox"/> Customer information and contracts <input type="checkbox"/> Internal audit
	Technical and administrative (execution and supervision of routine tasks)	<input type="checkbox"/> Current accounts records <input type="checkbox"/> Customer records <input type="checkbox"/> Stores procurement and control	<input checked="" type="checkbox"/> Billings & collections <input checked="" type="checkbox"/> Customer database <input type="checkbox"/> Stores procurement and control	<input checked="" type="checkbox"/> Billings and collections <input checked="" type="checkbox"/> Customer database <input checked="" type="checkbox"/> Stock control
routine	Artisan (simple technical and clerical competence)	<input checked="" type="checkbox"/> meter reading <input checked="" type="checkbox"/> collections <input checked="" type="checkbox"/> preparation of bills <input checked="" type="checkbox"/> record-keeping <input checked="" type="checkbox"/> liaison with customers and interest groups	<input checked="" type="checkbox"/> meter reading	<input checked="" type="checkbox"/> meter reading

What can be said with certainty is that, even at the threshold population, there is a requirement for a recognizable if small core of dedicated numerate people with basic literacy and some sector experience and/or training. They will have full time obligations but may be employees or secondees from other organizations and they will require outside help, direction and guidance. Long before the

upper population range limit is reached there will need to be a fully-fledged organization with sector professionals in water supply and sanitation, business management and accountancy. There will be a need too for understanding of economics and construction procurement. There will be a supporting administration and labor force. Such an organization will be able to determine when and to what extent it needs outside assistance. It will be capable of procuring such assistance and understand the implications of its actions, arguing its case and dealing with customers, collaborators and other interested parties.

3.2 *Types of skills*

The presumption that potable water should be delivered to customers at low cost tends to ignore the fact that a wide range of skills is required and that effort and cost will be substantial. It would be very involved to set out functions in detail but Table A4.3 provides a general guide to the levels of different skills needed in broad categories of functions. The intensity of effort (high, medium, low) may be a guide to where full-time, part-time and occasional input is likely. Needed skills will be professional and artisan in their nature and blurred by people working in say plant operations rather than civil engineering, customer services rather than accountancy, business planning rather than economics. How they might be combined with advantage will critically depend on what skills can be identified or created by training in given situations. The case studies in Section 4 help to illustrate how various skill levels are provided in specific organizations.

Table A4.3 – Intensity of discipline input

Discipline	Water supply	Water Distribution	Customer services	Financial
Accountancy	low	low	medium/high	high
Economics	medium	medium	high	high
Water engineering	high	high	low	medium
Scientific services	high	low	high	low
Computer applications	high	high	high	medium
Business management	medium	medium	high	medium
Legal services	low	medium	high	medium
Administration	low	low	high	medium
Fixed plant operations	high	high	low	low
Supply system maintenance	high	high	low	low
Mobile plant operations	high	high	medium	low

3.3 *Management models and affordability*

We can look at the affordability issue by relating input costs to the customer base. We should accept that for smaller communities, staff to connection ratios will tend to be higher than average and that the more dispersed are communities the more difficult it is to combine and share effort. If we also say that the earnings ratio (manager salary : laborer salary) within an organization could be 5:1 then some figures emerge (Table A4.4).

Table A4.4 Functions and staffing needs related to customer incomes

Cost of services in equivalent number of customers' earnings									
Pop 100%	Customers 40%	Earners 90%	Cost ratio 1.5%	Ops 100%	Labor 30%	Power 20%	Maint 15%	Consum 20%	Assets 15%
5000	2000	1800	27	27	8	5	4	5	4
25000	10000	9000	135	135	41	27	20	27	20
45000	18000	16200	243	243	73	49	36	49	36
65000	26000	23400	351	351	105	70	53	70	53
85000	34000	30600	459	459	138	92	69	92	69
105000	42000	37800	567	567	170	113	85	113	85
125000	50000	45000	675	675	203	135	101	135	101
145000	58000	52200	783	783	235	157	117	157	117
165000	66000	59400	891	891	267	178	134	178	134
185000	74000	66600	999	999	300	200	150	200	150
205000	82000	73800	1107	1107	332	221	166	221	166

Organizations	Manager	Engineer	Account	Technic	Admin	Ops	Labor	Equiv
8					1	1	1	2
41		1	1		2	3	3	7
73	1	1	1		4	5	5	12
105	1	1	1		6	7	7	17
138	1	2	2		8	9	9	22
170	1	2	2		10	11	11	27
203	2	2	2		12	13	13	32
235	2	2	2		14	15	15	37
267	2	3	3		16	17	17	42
300	3	3	3		18	19	19	47
332	3	4	4		20	21	21	52
	Manager	Eng / Acc		Tech	Adm / Ops		Labor	
Salary factors	5	4		3	2		1	

First an explanation of the way that the table has been compiled, using the row starting with the population figure 5000 to explain each column in turn:

- The column headed *Customers* indicates the assumption that for a population of 5,000 we can expect about 2,000 adults (40% of the population).
- *Earners* are those who pay, assumed to be 90% of the adult population (1,800 people).
- *Cost ratio* is the percentage of their income that the “earners” are willing to pay for a water service. The figure of 1.5% is conservative, but takes into account that we are considering water services only. Higher figures – up to 5% – are sometimes used, but they generally include sewerage services. The number 27 here is 1.5% of 1800, so it is the number of customers whose full annual earnings are available.
- *Ops* = operations, and is the cost of all activities to be funded from the income. Again it is expressed as the equivalent number of customers.
- The next five columns divide the operations into components: *Labor* – possibly a bit tight at 30% of the total operations cost, *Power* – 20%, *Maintenance* – 15%, *Consumables* – 20%, and *Assets* – meaning the costs of materials dedicated to substantive work on buildings and equipment – 15%, all in people equivalents. These percentages will vary significantly from town to town, but the headings indicate the main cost centers that have to be taken into account.
- So, the upper part of the table indicates in the highlighted *Labor* column that in a town with a population of 5,000, the amount of water revenue likely to be available for staffing the water organization is equivalent to the annual income of eight paying customers.

- In the lower part of the table those Labor figures are used under the heading *Organizations* to illustrate the numbers of different types of staff that the water organization might need to finance from the available income. The salary factors in the bottom line show the proportionate salaries of the different levels of staff, and these have been used to calculate the “staff equivalents” shown in the final column of the lower part of the table.

What the tables indicate are that at a rate of 1.5% of income coarsely represented by an estimated number of income providers it should be possible to provide the orders of people necessary to run the services. Equally it should be possible to deliver the other inputs. Of course, for this coarse representation to work, we have to assume that employee cost will be in the right proportions to the mix of customers’ incomes. The percentage relationships are not entirely theoretical.

The aim with this exercise is to express affordability in terms of person equivalents, using broad ratios that have some respectability and history. It should lead to the sorts of organizational frameworks that might be sustainable so long as revenues were collected – or other funds put in place if tariffs were distorted for social reasons.

The analysis also makes a fundamental assumption that within any town community there is likely to be sufficient range of skills applied to other businesses as would be required to run a water supply business. Wealth generation would be such as to support water supply as a compatible industry.

At the 5,000 population level, even a low grade operation could not support senior management and technical input. This does not imply that they are not required but that they would have to be provided from some higher level as shared inputs. At 25,000 population, a departmental organization with senior professional staff is supportable but it is difficult to see that a manager would be sufficiently busy to justify a full time position. However a contribution to shared management should be supportable. Upwards of 45,000 to 50,000 populations, comprehensive business structures should be sustainable.

4 Some cases

The case studies that follow show how individual towns and cities of different sizes have organized their water services.

Subic Bay Freeport Zone - Following the departure of US military forces, the Government of the Philippines established the Subic Bay Metropolitan Authority in 1992 to administer an economic development zone. The Zone encompasses the ex-naval base and four local government areas with autonomous “Water Districts”. The naval base area had good quality fixed assets and expanding commercial development. The Water Districts served local government areas with populations of about 210,000 (Olongapo City), 55,000 (Subic Town), and 17,000 and 34,000 in two semi-rural areas. Services in the two larger towns covered about 50% of the populations, and in the smaller towns far less than that. The operation in the ex-naval base was run by semi-skilled staff, but with no experienced management. Olongapo and Subic were run by experienced managers, but with inadequate financial resources, a backlog of deteriorating assets and increasingly severe water resource constraints.

A mixed ownership operating company was established in 1997 between SBMA, Olongapo City (as inheritors of Olongapo Water District), a Philippines construction company, and an international water operator. The Subic Water District elected to continue as an independent provider. The other two areas were found to have financial and technical characteristics that could not be absorbed by a viable mixed ownership company, and therefore continued under the support of the central government Local Water Utilities Administration.

The company (Subicwater) continues to operate despite political difficulties and limited approvals for tariff increases. With a core team of a commercial and an operating manager, commercial systems and operating efficiencies have been improved, supplies to Olongapo City were quickly enhanced through relatively low cost engineering solutions, and business planning has impressed upon the public sector owners the essential relationships between demand, development and finance. If institutional and tariff difficulties could be overcome, there should be good opportunities for the new company to extend its growing expertise to support the other operations within the Zone.

Dee Valley Water Co (Wrexham and Chester Water Companies) – is a water only company operating on the northern English/Welsh border. Made up of the privatized former statutory companies of Chester Water Company (100,000 pop) and Wrexham and East Denbighshire Water (130,000 pop), it has a Board of executive and non-executive directors, technical and administrative staff, an in-house labor force and it also uses outside consultants and contractors. Before consolidation, Chester Water was based on the compact supply to the city of Chester and had a core professional management of a Managing Director (and Chief engineer), Finance Director (and Company Secretary) and a general factotum assistant engineer who dealt with day to day operations, construction contracts and the like. Overall around 85 people were employed, with 25 dedicated to customer services, 15 to water production, 25 to distribution system operation, five in administration and two in the laboratory.

Its assets were a river intake, central surface water treatment works, service reservoirs and an urban distribution system. It had relatively straightforward management and monitoring systems, computerized billing and controls, paper and computerized records and laboratory services. A lot of knowledge was stored effectively in the memories of staff and there was considerable overlap in understanding the business. It engaged consultants to carry out study, design and construction supervision works, and contractors for large or prototype works, but main-laying and leakage control were in-house activities. While serving a mid-range population it nevertheless included all of the functions shown in Table A4.1, the stimulus being the operating environment and standards to be met rather than the number of customers.

Early outsourcing transferred lab services to Wrexham. Combining the companies reduced headquarters operations and further optimized field and office activity.

Azurix (Province of Buenos Aires) – was the concessionaire (until the contract collapsed in 2001) for a disparate collection of centers across much of the province of Buenos Aires, Argentina. The provincial envelope is of the order of 560km wide and 800km deep and the concession served 49 areas, some of which are contiguous, within eight boundaries. Structuring the business was part of the transitional activity to deal with the privatization package offered by the Provincial Government. Small self-contained offices were established at a local level and were supported through the organizational structure.

The structure included Directorates covering administration, finance, regulation, planning and commercial activity; public relations, legal affairs and human resources, and an Operations Group. The Operations Group was significant in that its development was to manage twelve new regional centers, some very remote from Headquarters. Two central stores were created to service the north and south regions of the concession. A Process and Quality Department had responsibility for engineering, construction performance monitoring and transfer of finished works to Operations.

The Regional structure initiated and implemented during the short life of the concession was shaping up to respond to the logistic realities imposed by the distances within and between areas and had created a local presence with an increasingly visible identity.

Table A4.2a – Water and Wastewater function - indicative application of skill levels with changing town size

Key: periodic continuous

Skill type	Skills level	Town population range		
		2,000 to 20,000	20,000 to 50,000	50,000 to 200,000
specialist	Policy-and supervisory	<ul style="list-style-type: none"> <input type="checkbox"/> Performance assessment and direction <input type="checkbox"/> Regulatory and other reporting 	<ul style="list-style-type: none"> <input type="checkbox"/> Definition of performance objectives within overall business plan <input type="checkbox"/> Review and approval of system replacement and enhancement proposals 	<ul style="list-style-type: none"> <input type="checkbox"/> Definition of operating and maintenance policies and priorities <input type="checkbox"/> Review and approval of planning and budgets as part of overall business plan <input type="checkbox"/> Approval of emergency plans
	Professional (planning, management and monitoring of technical and administrative tasks)	<ul style="list-style-type: none"> <input type="checkbox"/> Review and approval of guidelines <input type="checkbox"/> Approval of budgets 	<ul style="list-style-type: none"> <input type="checkbox"/> Preparation of operating and maintenance programs and procedures <input type="checkbox"/> Assessments and proposals for system replacements and enhancements 	<ul style="list-style-type: none"> <input type="checkbox"/> Design of systematic serviceability assessments and improvement programs and budgets <input type="checkbox"/> Preparation of emergency plans
		<ul style="list-style-type: none"> <input type="checkbox"/> Performance monitoring, technical advice and costing <input type="checkbox"/> Preparation of operating and maintenance guidelines <input type="checkbox"/> Preparation of job descriptions 		<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Implementation and monitoring of specific and continuous improvement programs and efficiency initiatives
		<ul style="list-style-type: none"> <input type="checkbox"/> Performance, costs and quality management <input type="checkbox"/> Quality monitoring and reporting <input type="checkbox"/> Organization and supervision of major plant servicing and specialist repairs and buildings maintenance 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Performance, costs and quality management <input checked="" type="checkbox"/> Budget preparation and management <input checked="" type="checkbox"/> Quality monitoring, reporting and remediation measures <input checked="" type="checkbox"/> Organization and supervision of major plant servicing and specialist repairs and buildings maintenance 	
routine	Technical and administrative (supervision of routine tasks and execution of specialist tasks)	<ul style="list-style-type: none"> <input type="checkbox"/> Performance supervision <input type="checkbox"/> Quality testing <input type="checkbox"/> Organization or execution of specialist servicing and repairs <input type="checkbox"/> Indents for stores and spares <input type="checkbox"/> Identification of replacement or enhancement needs 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Supervision of treatment works processes <input checked="" type="checkbox"/> Quality testing <input checked="" type="checkbox"/> Execution of major services and specialist repairs <input checked="" type="checkbox"/> Supervision and execution of systematic fault detection and rectification programs <input checked="" type="checkbox"/> Indents for stores and spares <input checked="" type="checkbox"/> Record keeping and performance reporting 	
	Artisan and clerical (simple technical and clerical competence)	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Daily operation & routine servicing of gates, pumps, valves etc. <input checked="" type="checkbox"/> Simple repairs to distribution and collection systems <input checked="" type="checkbox"/> Basic servicing and repairs to mobile plant 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Simple buildings maintenance work <input checked="" type="checkbox"/> Installation and repair of service connections <input checked="" type="checkbox"/> Record keeping 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Operation of simple treatment works <input checked="" type="checkbox"/> Record keeping and performance reporting

Table A4.2b – Customer Services function - indicative application of skill levels with changing town size

Key: periodic continuous

Skill type	Skills level	Town population range		
		2,000 to 20,000	20,000 to 50,000	50,000 to 200,000
specialist	Policy-and supervisory	<ul style="list-style-type: none"> <input type="checkbox"/> Tariff policy <input type="checkbox"/> Performance supervision 	<ul style="list-style-type: none"> <input type="checkbox"/> Tariff policy <input type="checkbox"/> Performance supervision <input type="checkbox"/> Connections policy 	<ul style="list-style-type: none"> <input type="checkbox"/> Tariff changes <input type="checkbox"/> Performance supervision <input type="checkbox"/> Connections policy <input type="checkbox"/> Customer group liaison and regulatory reporting
	Professional (management of routine tasks and development and implementation of enhancements)	<ul style="list-style-type: none"> <input type="checkbox"/> Performance management <input type="checkbox"/> Tariff review <input type="checkbox"/> Internal audit 	<ul style="list-style-type: none"> <input type="checkbox"/> Performance management <input type="checkbox"/> Tariff review <input type="checkbox"/> Internal audit <input type="checkbox"/> Customer information and contracts <input type="checkbox"/> Services contracts <input type="checkbox"/> Current accounts <input type="checkbox"/> IT systems 	<ul style="list-style-type: none"> <input type="checkbox"/> Tariff review <input type="checkbox"/> Services contracts <input type="checkbox"/> IT systems <input type="checkbox"/> Contract and agreements design
	Technical and administrative (execution and supervision of routine tasks)	<ul style="list-style-type: none"> <input type="checkbox"/> Current accounts <input type="checkbox"/> Customer records <input type="checkbox"/> Stores procurement and control 	<ul style="list-style-type: none"> <input type="checkbox"/> Billings & collections <input type="checkbox"/> Customer database <input type="checkbox"/> Stores procurement and control 	<ul style="list-style-type: none"> <input type="checkbox"/> Performance management <input type="checkbox"/> Current accounts <input type="checkbox"/> Stores procurement <input type="checkbox"/> Customer information and contracts <input type="checkbox"/> Internal audit
routine	Artisan and clerical (simple technical and clerical competence)	<ul style="list-style-type: none"> <input type="checkbox"/> meter reading <input type="checkbox"/> collections <input type="checkbox"/> preparation of bills <input type="checkbox"/> record-keeping <input type="checkbox"/> liaison with customers and interest groups 	<ul style="list-style-type: none"> <input type="checkbox"/> meter reading <input type="checkbox"/> record keeping and general administration 	<ul style="list-style-type: none"> <input type="checkbox"/> Billings and collections <input type="checkbox"/> Customer database <input type="checkbox"/> Stock control

Table A4.2c – Personnel function - indicative application of skill levels with changing town size

Key: periodic continuous

Skill type	Skills level	Town population range		
		2,000 to 20,000	20,000 to 50,000	50,000 to 200,000
specialist	Policy-and supervisory	<ul style="list-style-type: none"> <input type="checkbox"/> Definition of employment, remuneration and benefits policy <input type="checkbox"/> Regulatory and other reporting 	<ul style="list-style-type: none"> <input type="checkbox"/> Review and approvals of development and incentive programs in the context of overall business planning <input type="checkbox"/> Review and approvals of promotion and appointment proposals 	
	Professional (design and management of routine tasks, execution of specialist tasks)	<ul style="list-style-type: none"> <input type="checkbox"/> Payroll administration <input type="checkbox"/> Recruitment of professional and supervisory staff <input type="checkbox"/> Management of welfare and discipline issues <input type="checkbox"/> Organization of basic training <input type="checkbox"/> Performance analysis and remuneration and benefit proposals <input type="checkbox"/> Interpretation and advice on employment legislation 	<ul style="list-style-type: none"> <input type="checkbox"/> Preparation and costing of HR development programs <input type="checkbox"/> Development of staff incentive systems <input type="checkbox"/> Recommendations for senior appointments and promotions <input type="checkbox"/> Negotiations with staff and labor representatives 	
routine			<ul style="list-style-type: none"> <input type="checkbox"/> Payroll administration <input type="checkbox"/> Recruitment of professional and supervisory staff <input type="checkbox"/> Management of welfare and discipline issues <input type="checkbox"/> Management of staff development and incentive programs <input type="checkbox"/> Administration of training programs 	
	Technical and administrative (execution and supervision of routine tasks)	<ul style="list-style-type: none"> <input type="checkbox"/> Payment of wages <input type="checkbox"/> Management of welfare and safety issues <input type="checkbox"/> Identification of recruitment needs <input type="checkbox"/> Recruitment of labor, artisan and clerical staff 	<ul style="list-style-type: none"> <input type="checkbox"/> Payroll operation <input type="checkbox"/> Supervision of welfare and safety issues <input type="checkbox"/> Recruitment of labor, artisan and clerical staff <input type="checkbox"/> Organization of training programmes <input type="checkbox"/> Maintenance of staff database and records 	
	Artisan and clerical (simple clerical competence)	<ul style="list-style-type: none"> <input type="checkbox"/> Staff details and working time record keeping 	<ul style="list-style-type: none"> <input type="checkbox"/> General administrative duties 	

Table A4.2d – Financial function - indicative application of skill levels with changing town size

Key: periodic continuous

Skill type	Skills level	Town population range		
		2,000 to 20,000	20,000 to 50,000	50,000 to 200,000
specialist	Policy-and supervisory	<ul style="list-style-type: none"> <input type="checkbox"/> Accounting procedures, audit <input type="checkbox"/> Performance supervision 	<ul style="list-style-type: none"> <input type="checkbox"/> Funding policy 	<ul style="list-style-type: none"> <input type="checkbox"/> Pricing policy <input type="checkbox"/> Funding and regulatory reporting
	Professional (management of routine tasks and development and implementation of enhancements)	<ul style="list-style-type: none"> <input type="checkbox"/> Performance management <input type="checkbox"/> Accounting and bookkeeping review <input type="checkbox"/> Internal audit 	<ul style="list-style-type: none"> <input type="checkbox"/> Performance management <input type="checkbox"/> Accounting and bookkeeping review <input type="checkbox"/> Internal audit <input type="checkbox"/> Earnings and cost management <input type="checkbox"/> Funds management <input type="checkbox"/> Financial forecasting and modeling 	<ul style="list-style-type: none"> <input type="checkbox"/> Accounting and bookkeeping review <input type="checkbox"/> Financial forecasting and modeling <input type="checkbox"/> Pricing information
	Technical and administrative (execution and supervision of routine tasks)	<ul style="list-style-type: none"> <input type="checkbox"/> Accounting and bookkeeping <input type="checkbox"/> Simple earning and cost allocations <input type="checkbox"/> Cash handling 	<ul style="list-style-type: none"> <input type="checkbox"/> Accounting and bookkeeping <input type="checkbox"/> Complex earning and cost allocations <input type="checkbox"/> Funding and cash handling 	<ul style="list-style-type: none"> <input type="checkbox"/> Performance management <input type="checkbox"/> Funds management <input type="checkbox"/> Earnings and cost management <input type="checkbox"/> Internal audit
routine	Artisan and clerical (simple technical and clerical competence)	<ul style="list-style-type: none"> <input type="checkbox"/> Data posting <input type="checkbox"/> Directed analysis <input type="checkbox"/> Record-keeping 		

Table 2e – Capital Works function - indicative application of skill levels with changing town size

Key: periodic continuous

Skill type	Skills level	Town population range		
		2,000 to 20,000	20,000 to 50,000	50,000 to 200,000
specialist	Policy-and supervisory	<ul style="list-style-type: none"> <input type="checkbox"/> CAPEX approval <input type="checkbox"/> Performance supervision 	<ul style="list-style-type: none"> <input type="checkbox"/> CAPEX/OPEX policy <input type="checkbox"/> Construction contract approvals 	<ul style="list-style-type: none"> <input type="checkbox"/> CAPEX/OPEX policy <input type="checkbox"/> Construction contract approvals <input type="checkbox"/> Works regulatory reporting
	Professional (management of routine tasks and development and implementation of enhancements)	<ul style="list-style-type: none"> <input type="checkbox"/> Performance management <input type="checkbox"/> CAPEX planning and review <input type="checkbox"/> Internal audit <input type="checkbox"/> Scheme design <input type="checkbox"/> Project management 	<ul style="list-style-type: none"> <input type="checkbox"/> Performance management <input type="checkbox"/> CAPEX planning and review <input type="checkbox"/> Internal audit <input type="checkbox"/> Project selection, standards and plant types <input type="checkbox"/> Budget management <input type="checkbox"/> Scheme design <input type="checkbox"/> Project management 	<ul style="list-style-type: none"> <input type="checkbox"/> CAPEX planning and review <input type="checkbox"/> Project selection, standards and plant types
	Technical and administrative (execution and supervision of routine tasks)	<ul style="list-style-type: none"> <input type="checkbox"/> Engineering schemes <input type="checkbox"/> Contract supervision <input type="checkbox"/> Project progressing 	<ul style="list-style-type: none"> <input type="checkbox"/> Engineering schemes <input type="checkbox"/> Contract supervision <input type="checkbox"/> Project progressing <input type="checkbox"/> Direct works projects 	<ul style="list-style-type: none"> <input type="checkbox"/> Performance management <input type="checkbox"/> Budget management <input type="checkbox"/> Scheme design <input type="checkbox"/> Project management <input type="checkbox"/> Internal audit
routine	Artisan (simple technical and clerical competence)	<ul style="list-style-type: none"> <input type="checkbox"/> Small project labor and plant operations <input type="checkbox"/> Construction inspection 	<ul style="list-style-type: none"> <input type="checkbox"/> Small project labor and plant operations <input type="checkbox"/> Construction inspection <input type="checkbox"/> Record-keeping 	

**Town Water Supply
and Sanitation Services
Volume 3**

**Procurement Planning for Private
Participation in Town Water Supply and
Sanitation**

Companion Paper A5

**Paul Stott
July 2003**

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Companion Paper A5: Procurement Planning for Private Participation in Town Water Supply and Sanitation

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Innovations in bundled design, build and operate contracts and partnering mechanisms

Paul Stott

July 2003

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Abbreviations

BOOT	Build, Own, Operate and Transfer
BOT	Build Operate and Transfer
CPI	Consumer Price Index
DBL	Design, Build, Lease
DBO	Design, Build, Operate
FIDIC	<i>Federation Internationale des Ingenieurs-Conciels</i>
GCC	General Conditions of Contract
ICB	International Competitive Bidding
ICE	Institution of Civil Engineers (UK)
IFC	International Finance Corporation
KPI	Key Performance Indicator
NCB	National Competitive Bidding
NPV	Net Present Value
PPI	Private Participation in Infrastructure
PPP	Public-Private partnership
SBD	Standard Bidding Document
SCC	Special Conditions of Contract
SME	Small-Medium Enterprise
SPRC	Single Point Responsibility Contract

Executive Summary

1. Among communities worldwide that lack access to clean water, small and medium towns rank prominently among the worst served. The private sector is increasingly responding to demand in this niche by providing affordable solutions. Key characteristics of these schemes are their high value to customers and the assumption of operational risks and revenues by the contractor in a single point responsibility contract covering design, construction and operation. ‘Value’ is optimized through contributions of the contractor and other project stakeholders to the design and construction of the system, and importantly, its operation and financing. Can this model be emulated in town schemes that are funded with public resources? High quality services are required, together with efficiency and economy in construction. Private participation routes set particular challenges for public procurement due to the difficulty in establishing a common basis for price offers and bid evaluation. This paper asks the question, “What public procurement strategy would best fit this model?” and suggests an innovative role for procurement in public-private enterprises through partnering mechanisms.

2. ***Procurement of private participation is designed to align objectives of all parties and give full play to the contractor’s potential contribution to achieve best value for the users.*** Owners following conventional public works procurement routes aim to establish a required level of project value or functionality before inviting bids, and to use competition to find the lowest price for such functionality. The value judgments implied in the choice of functionality are often influenced by donors and regulators, among others having broader objectives. In these circumstances the bidder or contractor has little opportunity or incentive to add value; just simply to maximize profit. When the contractor assumes the operational risk however there is an interest in optimizing both operational efficiency and capital costs through the design and construction phases. **Modern, contract-partnering methods provide a manageable, structured approach to attaining best value as an outcome of bidding.** At a minimum, partnering is the chance for the bidder to offer an alternative design; at best it is an incentive-driven team effort to maximize value through continuous improvement of the facilities and their operation.

3. ***The contract packaging and procurement method will reflect the scope and scale of the project, and the way it is to be carried out. A town project could be a stand-alone project or, more likely, a subproject of a regional or national program.*** The scope of the town project could range from the management and operation of an existing system, with or without major rehabilitation and extension, to a complete ‘green field’ system development. The scope may also include leasing of the system assets by the operations contractor. Leasing can play a major role in the incentive and risk management structure of the project. For procurement purposes this means two basic forms of work package: (a) *management and operation of an existing system* including some rehabilitation and extension – a performance-based service with a small amount of works; and (b) *design, construction and operation of a new system* – performance-based works and services. The scale of a new project would reflect primarily the demand or ‘willingness-to-pay’ of the customers, and the subsidy policy of the government. The degree of cooperation warranted with other similar local governments to achieve economies of scale from bulk purchases and reduced overhead costs could also shape the overall project structure, and its investment and operational strategies.

4. ***In general, it is preferable that the owner or local authority should have a reasonable degree of autonomy in undertaking the project, and setting project policies and standards consistent with local demand.*** By definition, small towns often lack capacity to undertake major investment projects, relying on higher tier authorities for budgets, technical resources and approvals, and often surrendering their objectives in the process. At worst, public infrastructure may be provided as a ‘grant in-kind’, in that the project assets are

planned and procured by a higher authority and handed over on completion to the local owner for operation. While donors frequently support programs of higher authorities, their experience shows that local commitment and participation throughout is a vital project success factor. **Simple, tailored solutions are likely to bring greater benefits to and enjoy greater ownership and acceptance by individual communities.** Where project benefits are chiefly localized the responsibility and resources for providing them should also be decentralized. As an active participant, the town can acquire powers and resources that will help it define its objectives and realize them.

5. ***The procurement strategy has a major impact on the time scale and value of an investment project, and its selection is one of the most important decisions facing the owner.*** The procurement strategy provides the commercial and contractual framework of the project. Defining the project objectives and how to procure them, and choosing a project organization and its procurement functions must involve all stakeholders – community and industry, sponsors and donors. The objectives may be to get the best from an existing system, or to develop an affordable new system. **Most important is that water supply service is treated as a sustainable business venture, and private participation is best justified in this context.** The town may opt to cooperate with similar nearby towns to obtain synergies and economies of scale. In cooperation with others a town may opt to use an agent to select and employ the contractor and manage the contract. Official donors should be involved at an early stage. They may provide capacity building and planning resources and will have in any event a significant influence on project formulation.

6. ***Contracts based on partnering concepts and intelligent incentives, which allow the parties to share the project benefits (and risks), are most likely to achieve success and provide best value.*** Having defined the project structure and objectives, and identified the best source of potential bidders, the town must choose a procurement method that will help achieve best value efficiently (Figure 1). Smaller projects, that are simple and easy to define may benefit well from a single-stage bidding approach, perhaps allowing for alternative offers or design-and-construct arrangements. In larger, more complex projects, the options could include performance-based specifications, two-stage bidding, and special risk/reward sharing arrangements. **In all cases the aim should be to share with or assign to the contractor the operational risks and rewards.** These choices will be reflected in a special-purpose bidding document with appropriate contract conditions and payment arrangements, spelled out in simple terms and in the local language. Piloting of the methodology is important, in order to gain experience and refine arrangements in the local context. The success of the approach will depend to a great extent on the appropriateness of the contract documents and the attitudes and skills of the persons assigned by the parties to implement the contract.

7. ***Objective criteria that define ‘best value’ should be established early, to help align the interests of the stakeholders and provide a clear basis for bid evaluation.*** Bidders should be qualified in terms of experience and capacity, and invited to compete on what, for public procurement purposes, must be a level playing field. Bids must be evaluated and compared systematically to determine the best value offer. Value criteria would include quality and cost considerations. Bidding based on performance specifications may require a two-stage process. **Predetermined evaluation criteria and methodology would be set out in the bidding documents and designed to provide an objectively determined outcome, free from manipulative or corrupt influences.** The procurement procedure and award recommendations may, if external financing is employed, be subject to higher authority or donor review and concurrence before a contract is signed and the ground broken.

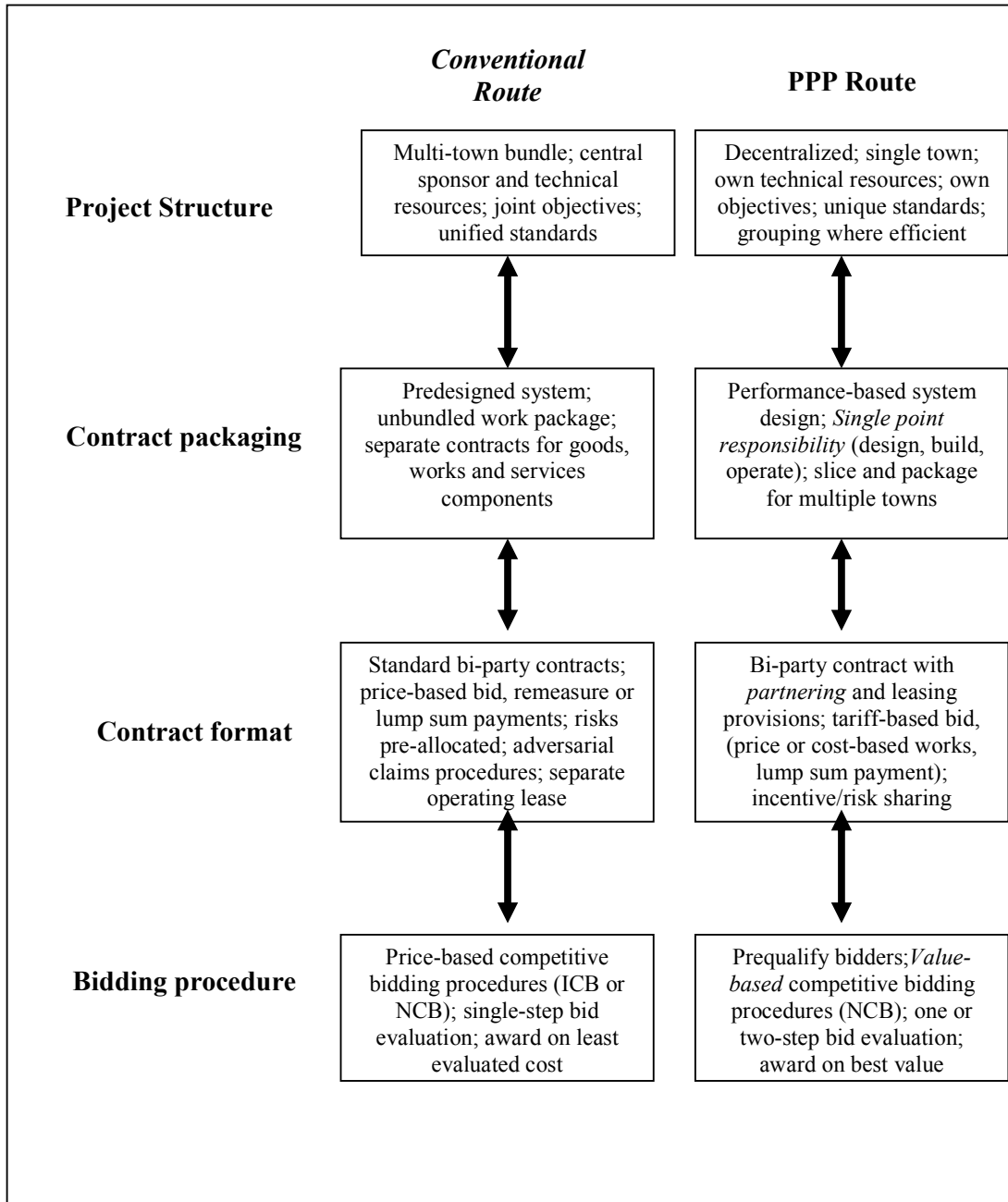
8. ***Partnering methods require a cultural shift, away from the conventional adversarial positions of the contracting parties, towards teamwork and collaboration.*** The goal of achieving best value warrants continuous cooperation between the employer and contractor in identifying opportunities and issues, and in handling change. Training of both

parties and continuous reinforcement will be necessary for this purpose. Implementation of the contract will continue for many years through the construction phase and the operational phase, and the parties must be equipped to jointly monitor performance and participate in change decisions. **The aim should be automatic enforcement of the contract terms through an emphasis on positive incentives in the interests of both parties**, instead of one-sided, negative incentives and dispute-resolution mechanisms.

9. For both project scale and procurement planning purposes some knowledge of the relevant domestic industry sectors is essential. Individual town systems are likely to be of most interest to the domestic small and medium enterprise (SME) sector. A bundle of such towns, closely situated, may be an opportunity of interest to larger, even international firms. **It is essential that contractors should be able to deliver reliably and to add value.** The contractor may be a joint venture of specialist firms or a single general contractor using specialist subcontractors. Ahead of large programs, program sponsors can help by undertaking a survey of domestic industry capacity, taking into consideration the experience of private participation in other utility sectors such as power and telecommunications, and the turnover capacity absorbed by other ongoing national programs. In this way ‘long-lists’ of potential bidders can be assembled for invitation to prequalify for different types of PPP bidding opportunities. Sponsors may also consider building industry capacity, through an information and education campaign aimed at equipping SMEs with better business skills and bidding techniques, an understanding of the risks and rewards of PPP ventures, and the benefits of partnering approaches.

10. The main body of this paper explores in three parts the procurement issues facing private participation in small town water supply systems funded by public finance, and presents procurement strategy options and resources that could contribute to a successful venture. Privately funded PPI approaches are referred to where relevant, to emphasize the contrasting issues in public funding. Part 1 of the paper: provides an introduction to private participation in water supply infrastructure; discusses the issues this raises in the choice of procurement strategy; and presents a range of procurement methods for works and services emphasizing partnering techniques. Part 2 provides practical details of procurement procedure choices and key considerations in drafting of bidding and contract documents. Part 3 looks deeper into the key provisions for operational services and leasing arrangements. Other key issues are discussed in detail in Annexes 1 to 3. The process for procurement of privately financed BTO contracts is described for reference purposes in Annex 4.

Figure 1 – Procurement Strategy Options



Part 1 – Issues in Procurement Strategies

Introduction

1.1 Among communities worldwide that lack access to clean water, small and medium towns rank prominently among the worst served. Increasingly, the domestic small and medium enterprise (SME) sector is spontaneously responding to demand in small towns by providing appropriate, affordable solutions. Private sector participation in infrastructure (PPI) has become an important means to provide services, add value and reduce public finance burdens¹. **PPI entails management and operation of existing systems and, to some degree, investment in rehabilitation and new or expanded systems through a single-point responsibility contract.** Promotion of PPI has concentrated largely on countries perceived to have lower risk markets of interest to larger investors. Legal frameworks are improving and a declining role for public enterprise is broadening the opportunity for PPI, but recent experience suggests that larger water sector firms haven't yet adopted the approach in smaller systems as a mainstream business and are not yet willing to risk their own capital.

1.2 The key characteristics of privately financed, small-scale PPI schemes in water supply are their high value to the customers in terms of price, and the assumption of operational risks and rewards by the entrepreneur in a lightly regulated environment, which contributes to production efficiency and lower prices (although not necessarily recognizing all social costs). Value is optimized by entrepreneur and community together in the design and construction, and importantly, the operation and financing of the system. Success reflects the flexibility of the entrepreneur, non-banking financial institutions and the community, using established local practices. Broad replication of such enterprise is limited, not least by SME sector creditworthiness and availability of capital for risky ventures, and by entrenched public utility monopoly regimes. The challenge is to develop the PPI approach for public financing and provide value without over-regulation or over-design, or undue risk. A PPI variant, the Public-Private Partnership (PPP) route offers a solution. PPP routes based on performance standards set particular challenges for public procurement due to the combination of Services and Works required, and in defining a common basis for price offers and bid evaluation.

1.3 This paper discusses briefly the procurement strategy options for publicly financed PPP approaches and the related choices and trade-offs facing promoters of town water supply schemes. In examining these choices a distinction must be recognized between project policy and procurement policy. While good procurement practice supports or enhances achievement of project policy objectives, it cannot correct policy deficiencies. Policy considerations in planning for affordable town supplies are considered in the main Volume 1 reports. Crucial in policy terms is that water supply service is treated as a sustainable business venture and private participation is best justified in this context. In establishing the business case, the objective of providing best value at reasonable price is paramount to the stakeholders. In obtaining best value it is important that the contractor help establish that value and face the operational risks entailed in the pricing structure. Existing schemes of doubtful integrity and uncertain functionality will not benefit from this approach to the same degree due to difficulties in mitigating operational risks; nor will new schemes assembled using conventional fragmented planning, procurement and implementation processes. Figure 1 above illustrates the differences between the conventional approach and the proposed single-point responsibility approach.

¹ World Bank 1995 "Private Sector Development In Low-Income Countries", Washington D.C. More recent studies by HM Treasury, UK confirms that private participation in public projects reduces risks and increases the likelihood of success. (Mott McDonald and Partners, July 2002, Review of Large Public Procurement in UK, HM Treasury, London). PPI as defined by the World Bank requires that the private company must assume operating risk of the service.

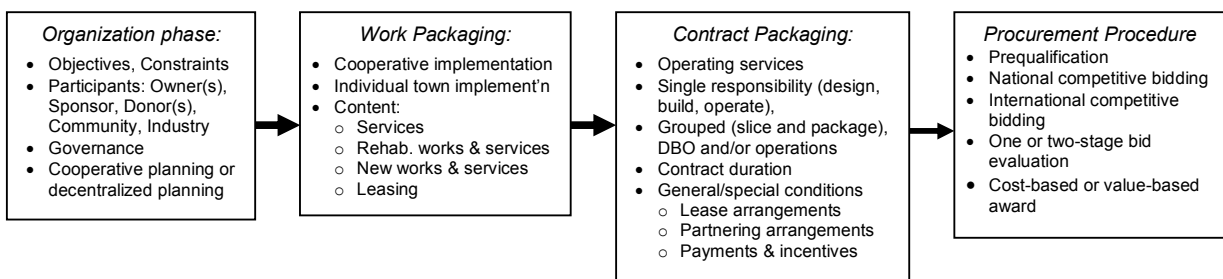
Selecting a Procurement Strategy

1.4 The procurement strategy has a major impact on the timescale and ultimate cost of an investment project, and its selection is one of the most important decisions facing the owner. Developing a strategy requires first a great deal of background information that will influence the choice of procurement route best fitted to the circumstances (see Box A5.1.1). Next is to develop a sense of the scope and scale of the work package and a suitable breakdown into contract packages for procurement purposes. Each contract package would typically have its unique contract terms and an appropriate bidding method, and the procedures used in bidding and selection would conform to relevant donor or public regulations. These choices can be summarized in a procurement plan for the project. The selection sequence is illustrated in Figure 2 below.

1.5 Procurement strategies for public projects must comply with current statutes and donor guidelines. Innovation in procurement strategy can add potential complexities to the project at the outset that may nullify potential advantages until sufficient experience and confidence are obtained, perhaps through a pilot phase. In addition to selection efficiency, public procurement strategies must typically also address broader objectives such as competition policy, local industry development, and the need for transparency and control of fraud and corruption risks.

1.6 In selecting a strategy it is vital to know what the project structure will be, who the stakeholders are and the roles that they will play. The structure could reflect a number of factors related to the sector governance arrangements: the scope and scale of the project; the sources of project funding; the roles and capacities of public and private stakeholders; and conditionality in agreements among the stakeholders. Many decisions may not in fact be within the grasp of the town. For PPP to be feasible, a suitable business case must be established and sponsorship from higher authority may be required for this purpose. Sponsors and donors may determine (with varying degrees of consultation) project formats and procedures reflecting their policies and constraints. Close early consultation with donor representatives will be essential in arriving at a suitable procurement strategy and plan².

Figure 2 – Procurement Strategy Selection Sequence



Who's involved and how?

1.7 Although there are just two parties to a contract, the key stakeholders in a public project structure and its procurement procedures may include the project owners³, their statutory supervisors or sponsors, the donor(s) concerned, the contractor, and, by extension, the customers. All these stakeholders have some interest in the project assets, their performance and their successful operation or the risk of failure. Their respective roles and responsibilities in the project, including procurement, would be established by agreement at

² Various donors have differing policies and if co-financing from two or more donors is used some harmonization of procedures (or division of labor) may be needed.

³ For a discussion of ownership options see Series B of these Companion Papers.

Box A5.1.1 - What information do we need to begin? In selecting a suitable procurement strategy, key contextual questions to be answered during the project concept formulation include:

- What is the current regulatory environment for public water supply and water resources management? To what extent can private entities take responsibility for public water supplies? Will special legislation be required?
- Who or what legal entity will be the owner of the assets created by the project? What is the extent of the owner's authority and capacity to sponsor such a project and enter into contracts?
- Where is the capacity in industry to respond to the opportunity?
- Will official donors be involved? What preparation and operational conditions will they set?
- Who will plan the project, assess the demand and make the preliminary business case reliably? Who will appraise the proposals and make the final business case?
- What are the scope, scale and standards of the project likely to be? Can these be well defined? Will the project be commercially viable at these standards?
- Will an existing system become part of the project? Is it fully operational and well documented? What are the problems?
- Will other owners be involved in similar projects at the same time? Is there an advantage in cooperating with them? Will training be required?

the project outset⁴, and may require some capacity building. Where it is possible to achieve significant economies of scale in cooperation with owners of nearby similar systems, the aim should be to have a transparent project governance mechanism, as well as a clear business case and an unambiguous allocation of responsibility for each of the individual systems.

1.8 *Will the owner be a simple beneficiary or take active responsibility?* In general, it is preferable that the owner or local authority should have a reasonable degree of autonomy to undertake the project, and to set standards consistent with local conditions. Worldwide experience indicates that, in addition to operations, responsibility for capital works is being increasingly decentralized to local levels. Hence the owner and employer for contractual purposes become one and the same, and accountability is clear. **It is assumed for the purposes of this paper that the beneficiary community, through its legal representatives, will be the project owner**, and that the owner would be the employer in the contract with the winning bidder and would be assisted by consultants in planning the business case performance requirements and in procurement. These assumptions reflect the full decentralization of responsibility inherent in the privately financed schemes referred to earlier, which allow direct interaction between community and contractor in defining mutually agreed objectives and achieving best value.

1.9 *Who would be the contractor?* The role of the contractor in PPP projects includes responsibility for operations as well as design and construction to varying degrees depending on the type of contract (see Box A5.1.2). Private contractors having the necessary experience and qualifications would be invited to bid in an open competition advertised nationally (or internationally depending on the scale of the contract). Direct appointment of contractors for larger scale works or services would be unacceptable in the competition policies supported by donors and most governments. Individual small town water supply systems are not expected to be of interest to foreign bidders, although a bundle of such towns, closely situated, may be

⁴ In procurement terms, the role of the owner, on behalf of the community, is to plan the procurement and prepare the bidding documents, to notify bidders, to receive and evaluate bids, award the contracts and supervise them (some of these functions may be carried out by consultants to the owner). The contractor's role is to purchase the bid documents, submit a qualifying bid and, if successful, to perform the work in accordance with the contract. The roles of donor and sponsor are to assist in procurement planning, to review advertisements and bid documents, bid evaluations and awards, and the contract. It should be noted that donors are not party to contracts that are financed from the proceeds of their assistance.

Box A5.1.2 - How large would be the Private Sector role? The following contract options for PPP are listed by scope of responsibility and increasing transfer of risk to the contractor:

- **Outsourcing** - contractors perform various functions for a price or fee. This could include hiring a contractor to manage and operate an existing system. Some rehabilitation or new components may be procured on a supply-and-install basis, including their design. The contractor carries most of the pricing and performance risks but the owner retains the financial risks, including cost overruns, and may retain most of the commercial risk. This is a weak form of PPP.
- **Design, Build and Operate (DBO) contract** is a blend of Turnkey and DBL (see below) approaches, where the contractor designs and constructs the assets for an agreed price, and bids to operate or manage the system for a share of the revenue but does not lease the assets. The contractor carries the performance and cost risks and some of the commercial risk while the owner carries the remainder of the commercial risk as well as the financial risk.
- **Design, Build, and Lease (DBL) contract** - a single contractor designs and constructs the assets and operates them under a lease, based on an agreed price for the construction and a competitively bid tariff. The contractor carries the cost risk and the commercial risk and receives the revenues from which the lease fee is paid, but the owner retains the financial risks. In 'green field' schemes the commercial risk may be shared to some degree.
- **Build, Operate and Transfer contract** - a single contractor is selected to design, build, finance and operate the assets for a fixed period based on a competitively bid tariff. The contractor owns the assets until transfer to the owner and carries almost all risks, but the eventual owner may carry some financial risk through guarantee arrangements.

so. Individual town systems may be of particular interest to the small-medium enterprise (SME) sector. For both program scale and procurement planning purposes some knowledge is necessary of the domestic construction sector and its capacity in turnover terms.

What Would the Project Structure Look Like?

1.10 The project structure will reflect the scope and scale of the project, and the way it is to be carried out. A town project could be a stand-alone project or, more likely, a subproject of a regional or national program. The scope of a town project could range from the operation of an existing system, with or without rehabilitation and extension, to a complete 'green field' system development. The scope may also include leasing of the system assets. For procurement purposes this means two basic forms of work package: (a) *Management and operation* of an existing system including rehabilitation and extension – a performance-based service with a small amount of works; and (b) *Design, construction and operation* of new or rehabilitated system – performance-based works and services.

1.11 The scale of a new town system would reflect primarily the demand or 'willingness-to-pay' of the customers, and the subsidy policy of the central or regional government. Scale within affordability constraints may be managed through staging of system investment costs⁵.

1.12 Cooperative projects. The degree of cooperation warranted with other similar local governments to achieve economies of scale from joint planning and fund raising, bulk purchases and reduced overhead costs shapes not only the overall project scope and scale but

⁵ A staged investment program envisaged over the medium term, say 3-5 years, could be accommodated in a term contract in which the bidder includes in a first-stage price the key unit rates for application in future stages (rates would be subject to a price-adjustment formula to reflect cost influences outside the contractor's control). However, investment programs that stretch beyond five years or so may benefit from re-bidding of works required in the later years, especially if the incumbent operator's contract has expired. The contract duration may be set either to allow full capital cost recovery during the contract term, which should not exceed fifteen years, or to promote competition for the operational concession at regular intervals, say five years. The first option would require a works-type contract and the second an initial works-type contract followed by a services-type contract for the subsequent operational phase.

Box A5.1.3 – Project Financial Arrangements and the Contract Terms. The contract documents must make clear the respective financial responsibilities of the parties during the construction and operating periods, including payments to the contractor for work done and fees due from either party as well as application of revenues. Owners of publicly funded assets may meet debt service obligations by opting to retain revenue with the private operator paid on a fixed fee-for-service basis (e.g. DBO contracts). Alternatively, the owner may assign the risk and the revenues to the operator and receive in return a lease fee equivalent to the debt service or, ideally, to full capital cost recovery (DBL contracts).

Small towns generally rely on higher-tier authorities for resources and authorizations. Resources for defining the project and preparing it for implementation may be provided ‘in-kind’ to the owner or procured by the owner (funded by a donor grant). Existing systems will need investments in rehabilitation and expansion, as well as working capital. New systems may need considerable investment capital. Capital costs may be financed from central and local budgetary resources, including donor funds. Although donor financing for part of the investment is often available to government as a grant or low-interest credit, government (and donor) policies may require such resources to be passed on to sub-borrowers as loans bearing market-related interest rates.

Investment capital, public or private, is at risk until debt has been serviced or asset depreciation fully funded. Debt service and/or depreciation must be covered, together with operating and maintenance costs and profit margins, from the revenue generated by the sale of water during the project lifetime. The operating contract term should ideally match the debt-repayment period, although a term exceeding 5-10 years may not be practical. A business case without adequate cost recovery is unlikely to be attractive to the private sector unless an adequate capital subsidy is available and committed under the contract. Working capital would typically be obtained by the contractor from savings or, more likely, from short-term commercial loans, repaid from revenues. Operating subsidies are to be avoided.

also the work packaging. Donor-assisted projects typically cover multiple towns; hence project aggregation or ‘bundling’ issues will arise in terms of the relative benefits of aggregated or disaggregated procurement at the subproject level. Cooperative ventures can make use of shared technical services, and use managed construction techniques or ‘slice and package’ bidding procedures that could reduce the aggregate procurement administration effort⁶. Nevertheless, despite the safety in numbers, cooperative projects can complicate communication and decision-making and often tend to move at the pace of their slowest member or component. Cooperation among decentralized authorities works best when they are located nearby and have similar objectives. Close proximity and similar technology are essential to obtain scale economies during construction.

Who would finance the project and how could this affect procurement planning?

1.13 Few towns have complete reliable systems and most are expected to require capital investment. Capital works projects require pre-investment financing, investment capital and working capital, some of which may need to be repaid. Project financing could be assembled by the owner from a number of sources, including: own savings; government grants and loans; official development assistance (as grants, credits or loans); and possibly from commercial sources, including the contractor. Due to the policies of the financiers, how that is arranged can greatly affect the procurement plan, and will be reflected in the bidding and contract documents (see Box A5.1.3). Table A5.1 below shows a schematic financing plan⁷

⁶ Consultants providing preparation and implementation services can be hired on a term contract to assist all participating towns. A management contractor can be selected to procure and supervise individual contractors for specific town schemes. Procurement for several nearby town schemes could be undertaken simultaneously in a single solicitation with qualified bidders able to make offers on more than one scheme. That could result in efficiencies and discounts due to economies of scale.

⁷ Not all components may be eligible for donor funding, and donor procedures would not apply to non-donor financed contracts. Moreover, not all associated costs can be directly charged to the project or included in the contract. Some ancillary costs such as land or water rights acquisition or off-site public infrastructure (e.g., access roads or power lines) might be borne by the owner from its own

Table A5.1 Schematic Regional Project Financing Plan

Application	Sources					Total
	Government	Beneficiaries	Donor A	Donor B	Contractor	
<i>Preparation:</i>						
Feasibility studies	0.1		0.9			1.0
Surveys	0.7					0.7
Land acquisition	0.5					0.5
Off site infrastructure	0.8	0.2				1.0
Prelim. design	0.2			1.8		2.0
Training	0.1	0.1	0.6			0.8
<i>PPI contracts:</i>						
Town system 1		0.1		0.9		1.0
Town system 2		0.2		1.8		2.0
Group town systems		1.0		9.0		10.0
System management	0.2				0.8	1.0
BOT contract					9.0	9.0
Monitoring	0.1			0.9		1.0
Total	2.7	1.6	1.5	14.4	9.8	30.0

that would involve harmonizing procurement policies of four participants – the government, two donors, and the contractor’s financiers. It should be noted, however, that not all components might be eligible for donor funding and this would be reflected in the donor agreement with government.

1.14 Public authorities using budgetary resources will be obliged to follow domestic procurement regulations unless these are fully or partly waived by agreement with a donor. Official donors such as the World Bank incorporate strict guidelines regarding procurement procedure as part of their financing agreements with government⁸ but can in some circumstances accept national procedures. In contractor-financed investments, procurement is normally arranged according to established commercial practices (see Annex 4).

1.15 Where public financing is obtained on a non-concessional basis⁹, contractor financing may be competitive but may mean that the contractor would obtain a commercial loan on the strength of the business case for the project and some form of repayment guarantee. In seeking contractor financing it should be recognized that creditworthiness is partly a direct function of the company’s size, net worth and track record. If the assets are created with private finance the commercial risks are taken by the contractor who then is responsible for debt service and depreciation. The asset ownership may be retained by the contractor (as collateral for the loans) for the duration of the contract, or transferred to the town at the outset in exchange for a lease and a loan repayment guarantee as stipulated in the contract.

resources and procured separately. Similarly, on-plot or in-house plumbing costs would be borne by customers and financed from their own resources.

⁸ World Bank 1999 *Guidelines*: for Procurement under IBRD Loans and IDA Credits; and for Selection and Employment of Consultants by World Bank Borrowers, Washington DC. Useful comprehensive guidance on the practical application of the *Guidelines* is available in the World Bank’s “Bank-financed Procurement Manual” (in Draft), Washington D.C., July 2001

⁹ In more mature financial sectors, donor funding for enterprise investment, albeit public resources, may be channeled for on-lending through the commercial banking system on an intermediary agency basis or as investment capital at risk to the commercial banks concerned. In such cases the donor would permit the beneficiary to use satisfactory established commercial procurement practices.

Table A5.2 Schematic Regional Project Procurement Plan (from Table A5.1)

Component	Procurement Method*					Total
	ICB	NCB	Consult.	Local	None	
<i>Consultants:</i>						
Feasibility studies			0.9		0.1	1.0
Prelim. Design			1.8		0.2	2.0
Monitoring			0.9		0.1	1.0
Training			0.6		0.2	0.8
<i>PPI contracts:</i>						
Town systems		2.7			0.3	3.0
Group town systems	9.0				1.0	10.0
System management		0.8				0.8
BOT contract				9.0		9.0
Surveys				0.7		0.7
Off site infrastructure				0.8	0.2	1.0
System repairs				0.2		0.2
Land acquisition					0.5	0.5
Total	9.0	3.5	4.2	10.7	2.6	30.0

*ICB International competitive bidding
 NCB National competitive bidding acceptable to donor
 Consult. Consultant selection procedure
 Local Established local or in-house procedure
 None Not competitively procured

Improving Procurement Outcomes through Partnering

1.16 Having defined the parties to the contract and their objectives, the focus can shift to completing the procurement plan by selecting the procurement packaging arrangements and appropriate procurement methods. Procurement packaging means making choices about unbundling the work package into contract packages. Each contract package will have an appropriate procurement method. Unbundling works best when technical requirements and outputs are standardized and well defined but for complete systems, when technical and operational options are available, performance-based bidding for single responsibility contracts has considerable advantages¹⁰. Partnering techniques can further enhance both methods, allowing the contracting parties to continuously improve the facilities and to establish the best value solution.

How should the work be packaged for procurement?

1.17 In a regional project there may be a number of owners (towns) and therefore a fundamental number of subprojects. Each subproject is a system of varying complexity but best procured complete, rather than through its component parts. Single-point responsibility allows for automatic allocation of responsibility for integration of design, and control of cost and performance risks of each system. Table 3 (attached) illustrates the main contractual options for private participation in terms of functional responsibility for system planning, finance, construction and operation, and the related risks. In some cases where strong

¹⁰ In cases where owner management and design capacity may be constrained and system integration is essential, responsibilities can be transferred to a suitable contractor. In a performance-based, PPP project the number of components would be minimized, with either a main contractor being held responsible for all subproject design, construction and operational inputs, or separate contractors similarly responsible for each subproject. By contrast, in a conventional project under strong management with a detailed design completed beforehand, each subproject could be broken down into a number of components intended to fit best with specialized contractors, such as goods supply, water well drilling, civil works, operations and maintenance, billing and collection, and so forth.

management capacity is present economies may be possible on behalf of all owners, as discussed earlier, through ‘slice and package’ procurement methods. Table 2 illustrates schematically a typical project procurement plan structure showing the packaging (including individual and grouped systems), and related methods.

Table 4 Typical Investment Project Risks

Risk Area	Characteristics	Avoidance/Mitigation
Capital Cost	Cost overruns due to unanticipated ground conditions, design changes, delays; accidents; unforeseen environmental impacts; Inefficiency due to corruption and fraud.	Thorough investigations; cost control and variation procedures; incentive mechanisms; liquidated damages; dispute resolution mechanisms; insurance. Anti-corruption measures
Performance	System does not perform as efficiently or quantitatively intended; life cycle shorter; raw water quality varies more widely than expected	Performance based specifications, thorough investigations; incentive mechanisms, functional guarantees and liquidated damages
Commercial	Operating costs higher; volume sales and revenues lower; breakdowns, fraud; assignment; insolvency	Demand/willingness to pay surveys; incentive mechanisms, monitoring; tariff adjustments; auditing; insurance
Financial	Income insufficient to meet debt service; counterpart funding unavailable	Financial modelling; debt increase or rescheduling; lease fee adjustment
Political	Regulatory changes; tariff control; expropriation,	Comfort letters, Contract default provisions

1.18 The distinguishing characteristics of good contracts are clarity and fairness. A single responsibility contract bundles together design, construction and operations services. The relative balance between services and works will determine the form of contract as either a services-type contract with provision for works, or a works-type contract including services requirements. The contract should set out clearly the obligations of both parties in situations likely to arise during the contract life, and it should protect each party fairly from the consequences of actions or failures to act of the other party. **Contracts based on partnering concepts and intelligent incentives, which allow the parties to share the project benefits as well as risks are most likely to achieve success and best value in practice.**

Partnering – what’s involved?

1.19 Partnering, simply put, aims to overcome the adversarial relationships characteristic of conventional contracts and to align the objectives of the parties to get them to work together to better ensure a high value outcome. Changing an adversarial culture to a cooperative one requires common objectives, a purposeful procurement procedure, shared information and appropriate contractual provisions, including suitable incentives and risk sharing arrangements. All parties, the owner, the consultant and the contractor, linked through bi-party contracts, are focussed by agreement on achieving the best performance for the mutual benefit of the partners. Characteristically the partnering procurement procedure would entail the following:

- (a) An opportunity for the contractor to contribute meaningfully to the project design based on a performance specification;
- (b) A value-based selection process that evaluates the quality as well as price of the offer;
- (c) A covenanted payment arrangement that includes bonuses and incentives for better performance according to measurable key performance indicators (KPI);
- (d) An explicit risk-sharing arrangement based on consideration of the ability of the respective parties to control each risk and their relative costs and benefits arising from doing so.

- (e) Provision for joint arrangements for information sharing, problem solving and performance monitoring.

1.20 Formal partnering methods are relatively new to public procurement although many aspects of current practice support partnering (e.g. alternative bids, design-and-build contracts, two-stage bidding methods, incentive-based payment mechanisms, dispute resolution procedures, etc). Drawing on these methods explicitly to enhance project value is important in detailing a PPP procurement strategy (see Annex 1 for a full discussion of partnering principles and current practices). Following is a brief discussion of some key aspects of partnering concerning value-based bidding and risk management to be considered during procurement planning.

Box 1.4 - Simplified Value Analysis for Bid Comparisons Net present value analysis techniques can be complex and a simplified approach is necessary for small projects. Value engineering techniques adopt an approximation of net present value using the formula $\langle \text{Value} = \text{Functionality}/\text{Tariff} \rangle$. Improved value occurs when either ‘functionality’ is increased (e.g., expanded hours of service, higher water quality, simplified billing, etc) or ‘tariff’ is reduced (i.e., reduced capital, maintenance or operating costs).

The components of ‘functionality’ are defined and ranked or weighted by the stakeholders prior to inviting bids. The functions, relative weights and scoring method are described clearly in the bidding documents. Bidders’ competing proposals for functionality and price are evaluated and scored. Where a component can be measured objectively its score is related to the measurement achieved related to the best/highest offer received. Subjective assessments are ranked on a scale ranging from the minimum acceptable to the maximum achievable. Tariff bids (or equivalent price offers) are scored and ranked relative to the lowest bid received.

Value-based Selection.

1.21 What does ‘best value’ mean? In conventional works procurement methodology ‘value’ is typically established ahead of bidding to provide a level playing field and facilitate fair price comparison. During planning, a least-economic-cost solution (i.e. the solution giving best net present value) is selected from among functional alternatives to the project objectives, based on estimates and assumptions robust enough to cope with various degrees of risk sensitivity. Competition through conventional procurement confirms the actual capital cost to be factored into the economic and business case analyses for the selected or implied level of functionality. In partnered procurement methods ‘value’ is established as a result of bidding, reducing the downside to the business case and increasing the upside possibilities. Partnered procurement permits bidders to offer through their proposed design, improved levels of functionality reflected in their bid price, that would meet or reduce the expected life-cycle cost of the project (i.e. improve the net present value).

1.22 Value-based procurement is difficult for a public sector used to conventional procedures. Value judgements in decision-making can open the door to manipulation and corruption that would be utterly unacceptable to financing institutions. The challenge for the procurement strategy is to adopt objective methods and criteria with which to evaluate and compare value offered by competing bidders. Small projects may require a simplified method for evaluating such offers (see Box 1.4). More complex projects may benefit from a two-stage evaluation process as described in Part 2.

1.23 The key to achieving best value lies in the potential contribution of the contractor that designs the integrated project and assumes its operational and financial risks for the long term. This opportunity is obviously less in the case where the system already exists to a large extent or when the operating term is short. Even so, the methodology may have benefits in coping with the risks inherent in operating an existing system of relatively unknown functionality. There is a real danger however in publicly financed new investments that a contractor could default on operations responsibilities, having been paid for the design and

Box 1.5 – Risk Allocation. Clarity in risk allocation in the contract documents is essential. Major risk allocation should be in proportion to the degree to which the party concerned can either influence the magnitude of the risk or minimize the consequences. A possible risk allocation matrix is given in Annex 2. Prudent contractors will charge a premium in their prices for taking on risk that they cannot control. A single point responsibility contract gives the contractor substantive control over costs and performance and reduces the need for any risk premium. Moreover, operational responsibility provides an incentive to maximize performance and minimize costs. Particular care will be necessary in balancing risks and incentives in the contract terms.

Maximum incentive occurs when the operator stands to profit directly from the project revenues, bearing little or none of the investment costs or financing risks, which would fall to the owner. This could be the case in an existing system with sunk costs leased to the operator on a cost-reimbursable basis. A design, build and operate/lease contract awarded on the basis of the lowest water sales tariff could also fit this model but, in practice, the tariff may be capped by regulation, the capital investment costs would be recovered from the operator (e.g., lease fee), and various operational risks to cash flow must be faced.

Among uncontrolled risks in a new water supply enterprise is the demand risk, i.e. that volume sales or revenues are lower than anticipated. This risk is especially strong in cases where contract award is on the basis of a water sales tariff subject to third party regulation by a national regulator or local political assembly. Despite the operator's incentive to increase sales, customers may revert to alternatives, not connect (or connect illegally) or purchase small quantities. Inadequate cash flow could lead to operator insolvency and leave the owner to finance debt service from alternative sources until revenues resume. Conversely, there is also a possibility that demand could be higher than anticipated, giving the operator a windfall profit, especially where a risk premium is included in the tariff bid. In this case the risk (and reward) can be usefully shared between owner and contractor through an appropriate formula.

construction. The contract therefore must provide safeguards. These would include positive incentives in the interests of both parties, such as revenue sharing, rather than one-sided, negative incentives, which can actually be counterproductive.

Incentives and Risk Management.

1.24 As commercial ventures, water enterprises face a broader range of risks due to external financing/loan exposure than is the case in ordinary public works construction. In addition to the risk of cost overruns, there are also performance risks and operational risks that may affect the project's ability to meet debt service requirements. Typical project risks are shown in Table A5.4. Efficient risk allocation and mitigation are central to bringing infrastructure projects to financial closure and to providing appropriate incentives during construction and operation (see Box A5.1.5). The contract terms, including sharing arrangements, will be central to management of these risks (see also Part 2, Box A5.2.5).

1.25 Management of risks (and accountability for failure) is more difficult in the conventional, fragmented and adversarial approach to project planning, design, construction and operation. Experience with disputes resolution mechanisms is limited and decisions cannot always be enforced in the courts. Legal suits, related pleadings and interpretation of contract documents add up to an invariably lengthy process and are therefore rarely pursued. Negotiated settlements are the preferred method of resolving disputes. An appropriately designed PPP contract with single point responsibility has the potential for better risk management through better project integration, unified construction management, and control of input costs, which means that the contractor is in a good position to control cost and performance risks.

1.26 As illustrated in Figure 3, various contract arrangements place commensurately less risk on the owner in terms of the overall financial risk. Fragmented contracts pose the highest risk for the owner and BOT contracts pose the lowest. DBO and DBL are designed to share and manage the risk. Risk management is generally of greater concern in the private sector than the public sector due to smaller margins and harder budget constraints. Commercial and

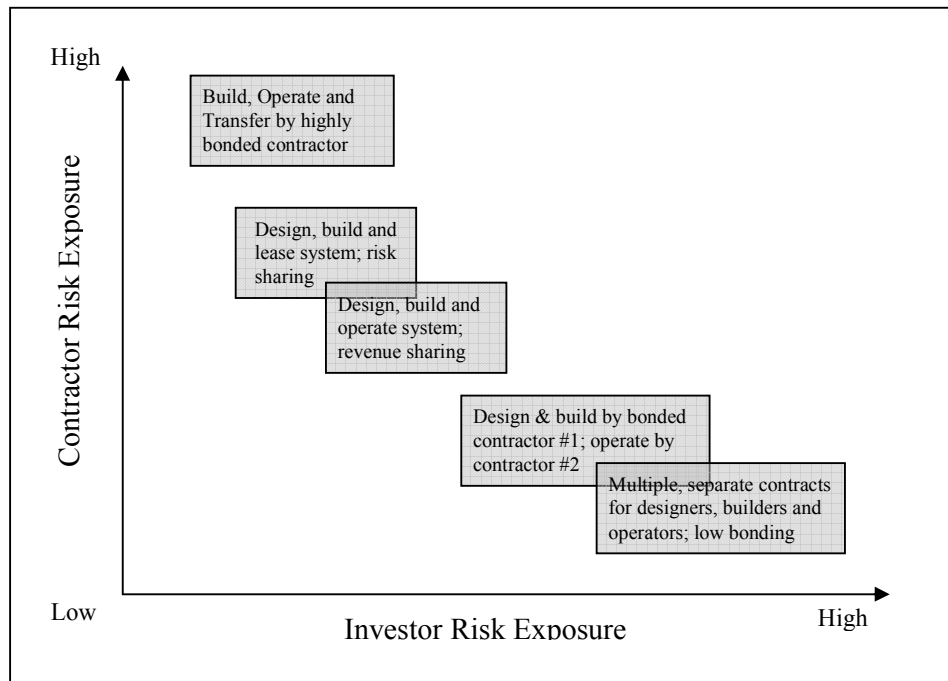
official financiers will set conditions for their project support including not only a sound business case but also a clear risk management plan and guarantees. Such a plan would also be central to any partnering arrangements (see Annex 2 for a discussion of risk allocation and management planning). Partnering methods can reduce or mitigate risks for both parties.

1.27 In all cases the contractor’s work should be guaranteed to ensure that covenanted quality, cost and time objectives are met. It should be supervised as in conventional contracts and operations must be regulated and monitored. Selection of contract administration and quality control consultants to assist the owner in this task can follow quality and cost-based procedures or may be part of the preparation consultant’s scope of work, with due provision for any partnering methods adopted in the contract.

So, What Procurement Procedure Should Be Used?

1.28 The aim of the procurement procedure is to secure the objectives of the chosen method through a bidding process that is fair, transparent and efficient. The advantages of PPP would flow ideally from experienced, successful domestic contractors with substantial corporate assets. In reality, the domestic sector may be limited in experience and capacity. The procurement process must therefore help ensure, ideally through prequalification¹¹, that appropriately qualified bidders participate in the competition and can provide an adequate guarantee of their performance. Public procurement regulations and many donor procurement policies typically require open competition on price in the international or national market.

Figure 3: Contract Types & Risk Trade-offs



1.29 Conventionally, as the basis for the price to be offered, an owner would select a standard bidding procedure template¹² with industry standard contract conditions, and adapt it to the project along with a description of the scope and quantities of work, the minimum quality and performance standards required, and the payment arrangements. Different

¹¹ The World Bank (www.worldbank.org) publishes a Standard Prequalification Document suitable for use in Bank-financed projects.

¹² Numerous standard bidding and contract document templates are available for works or goods contracts of various size, including the suite of Standard Bidding Documents (SBD) maintained by the World Bank for mandatory use as templates by its Borrowers (see Part 2 of this paper).

versions may be used depending on the nature of work and the relative responsibility of the contractor to achieve a fit-for-purpose product, as well as the attractiveness of the work to international bidders¹³. However, few ready-made templates are available that also include operating performance requirements, leasing agreements or partnering mechanisms. Hence a special purpose bidding document will be necessary for PPP procurement purposes.

1.30 The provisions of a PPP contract can be more extensive than those of a conventional construction contract due to the combination of design and operations services, and related leasehold arrangements required. This is especially true where partnering arrangements are entailed, although any partnership agreement should not take precedence over bi-party contracts. Technical specifications, on the other hand, may be shorter when performance standards and/or two-stage bidding are used, and activity schedules may also be used instead of an extensive bill of quantities. ‘Best practice’ bidding documents are discussed in Part 2 together with examples of formats and key provisions.

Capacity Building

1.31 An important element of a town water supply program will be capacity building, both for the owners and the bidders. Prospective owners of small town water supply systems may typically lack capacity to plan long-term, revenue-earning investments and to organize their procurement and the supervision of the contract. The need for strong management effort may arise due to the technical challenges in providing a reliable supply or the social issues entailed. Or there may be complexities due to the service area spanning two or more administrative areas or the water project being combined with investment in other related public services such as settlement upgrading or public health facilities, for example. New methodologies such as PPP and partnering also introduce complexities that can create extra difficulties at their outset. The in-house capacity of the project sponsor and subproject owners to provide leadership and to be a full partner in the process may need to be strengthened through training and reinforcement. Capacity may be usefully supplemented temporarily by experienced consulting services. Procurement of consulting services should be considered as part of the project procurement strategy. Selection is generally through a competitive process based on the quality of the consultant as well as the cost¹⁴. The terms of reference of the consultants should include their role in any partnering approach.

1.32 *Does the Requisite Capacity Exist in the Domestic Private Sector?* Clearly, the contractor must bring considerable experience and resources to bear in the process. It is essential that contractors should be able to deliver added value. Small-scale projects may lie within the capacity of the domestic industry but larger, grouped projects may require the services of an international contractor with the requisite experience, project management skills and financial capacity. In the case of individual town schemes, participation by domestic contractors is more feasible. Knowledge of domestic industry capacity is important and should take into consideration the existence of private participation in other utility sectors (power, telecoms) that has relevance to water supply. Countries with more mature private construction or service sectors are likely to have domestic contractors with sufficient managerial, operational and financial capacity, and adequate supplier networks to participate in DBO/L or BOT infrastructure projects, although extensive national programs may stretch even that capacity. For example, expenditure of \$50 million over five years (on about 100 small town systems) suggests that an annual industry turnover capacity of about \$15 million to \$20 million per year would be required at peak. This would be incremental to the turnover occurring in other ongoing water supply programs

¹³ A key decision would be the use (or not) of international competitive bidding (ICB) procedures. Although the scale of an individual town scheme is unlikely to be of interest to international firms, bundling of several, closely situated schemes into a single package could raise international interest.

¹⁴ Consultants are most likely to be hired by higher authority or in some cases by the donor. Advice on selection of consultants according to the World Bank Guidelines is available in the Bank’s Manual for Selection of Consultants together with standard Request for Proposal documents.

although foreign firms might provide some of this capacity. Not all contractors may be eligible to bid in view of official embargoes or state ownership.

1.33 Water supply schemes will require a wide variety of skills for the asset-creation phase (social marketing, engineering and financial services, well drilling, materials and equipment supply, civil works, building construction, and electrical and mechanical installation), and the operations phase (asset operation and maintenance, chemical analysis and dosing, waste management, marketing, billing and collection, accounting and personnel administration), as well as their management. In a PPP scheme a single contractor would be responsible for obtaining and managing all the various specialist inputs required for both phases. The contracting party could be a joint venture or general contractor/subcontractor arrangement.

1.34 Donor rules usually require that bidding opportunities be open to their member countries' firms. In order to better ensure fair competition, they also require all bidders to be eligible, autonomous commercial enterprises and may preclude dependent state-owned enterprises from bidding, especially those linked to the owner (such as in-house construction or operational departments), even if they are potentially strong partners. Donors may, however, wish to support development of local private industry, particularly small and medium enterprises (SME), and may agree to tailor contractor capacity requirements or allow greater subcontracting for this purpose, (provided in some cases steps are taken by government to also strengthen the market and SME business capacity).

1.35 While background SME development is helpful, a specific information and education campaign among potential domestic industry participants is essential. A baseline survey of existing firms and an understanding of their industry and company problems and development needs are desirable. On that basis, a training and development program can be launched to equip SMEs with improved business skills and techniques, and a clear understanding of PPP business risks and rewards and related public procurement procedures¹⁵.

1.36 Key indicators of contractor capacity would be past experience and track record, turnover and net worth, as well as available equipment and human resources (discussed in Part 2). An assessment of available capacity can be obtained through a pre-qualification process although some safeguards are necessary against corruption of this process. Subsequent bidding would be limited to firms that have prequalified successfully or, if prequalification is not used, bidding should be open to those that can provide an appropriate bid security and demonstrate adequate capacity through a post-qualification procedure .

Making the Choices

1.37 The formulation of a PPP procurement strategy for publicly funded small town water supply, as we have seen, is dependant on the scope and scale of the project, the policies of the sponsor and donor, and the capacity of the owner to manage the process and its attendant risks. This paper asserts that mobilizing the capacity of a private contractor through a single responsibility contract has considerable advantages for a small-system owner, and that even complex systems can be procured efficiently from domestic sources using incentive-based, partnering methods. Partnering methods are also advantageous when procurement is centralized on behalf of a number of similar owners. Partnering can reduce the inefficiencies of conventional, adversarial contracts and focus the parties' energy and initiative on achieving a best-value outcome to their mutual benefit. Many of the tools required for partnering are already available in standard bidding procedures but special purpose documentation is necessary to cope with the combination of works and services required. The success of the partnering route depends on aligning the parties' objectives through a well-designed, value-based procurement procedure, as well as on meaningful cooperation and risk allocation

¹⁵ Local industry development may also occur through structured subcontracting arrangements where an experienced general contractor is selected to undertake a large, multi-town PPP contract whose contract obligations include training and technology transfer to subcontractors.

among the stakeholders. Training of participants and piloting of partnering schemes would be important in building confidence in the method prior to its full-scale adoption.

Further Reading

1. Broome J. 2002 Procurement Routes for Partnering: A Practical Guide, Thomas Telford, London
2. World Bank 1995 Private Sector Development in Low-Income Countries, IBRD, Washington D.C.
3. World Bank 1996 Financing Private Infrastructure, Lessons of Development #4, IFC, Washington D.C.
4. Page H.R. 1980 Public Purchasing and Materials Management, D.C. Heath, Lexington
5. Meier G. (Ed) 1983 Pricing Policy for Development Management, Johns Hopkins, Baltimore
6. Institution of Civil Engineers and Institute of Actuaries 2002 RAMP - Risk Analysis and Management for Projects Thomas Telford, London
7. Inst. of Civil Engineers, Assoc. of Consulting Engineers, Civil Engineering Contractors Assoc. 2003 ICE Conditions of Contract, Partnering Addendum, Thomas Telford, London

Table 4. Procurement Profiles for Various Private Participation Options

		Procurement Method					
	Outsourcing: Operations	Outsourcing: Supply & Install	Turnkey	DBO	DBL	BOT	
Design risk	Owner	Owner/Contractor	Contractor	Contractor	Contractor	Contractor	
Performance risk	Owner	Contractor	Contractor	Contractor	Contractor	Contractor	
Commercial risk	Owner/contractor	Owner	Owner/contractor	Owner/contractor	Contractor	Contractor	
Financial risk	Owner	Owner	Owner	Owner	Owner	Contractor	
Critical success factors	Clarity of client's needs, objectives Consultant's competence	Clarity of client's needs, objectives Consultant's competence Contractor's competence	Clarity of client's needs, objectives Consultant's and Contractor's competence Owner's supervision capacity	Clarity of client's needs, objectives Consultant's and Contractor's competence Owner's supervision capacity	Clarity of client's needs, objectives Business case Consultant's and Contractor's competence Owner's supervision capacity	Clarity of client's needs, objectives Regulatory frame Business case Contractor's competence & financial resources	
Bidding method	Single stage	Single stage	Single stage	Single or two-stage	Two stage	Two stage	
Bidder qualifications	Prior experience Capacity	Prior experience Capacity	Prior experience Capacity Financial capacity	Prior experience Design capacity Financial capacity Operating capacity	Prior experience Design capacity Financial capacity Mngmnt capacity	Prior experience Track record Mngmnt capacity Subcontractor capacity	
Bid evaluation criteria ranking	Credentials Proposal quality Fee	Lowest evaluated cost	Lowest evaluated cost Proposal quality Track record	Lowest evaluated cost Operating fee	Lowest tariff Operating fee	Lowest tariff	
Payment method	Time-based Fee	Lump sum Activity schedule	Lump sum Activity schedule	Lump sum Activity schedule Operation fee	Lump sum Activity schedule Revenue (less lease fee)	Revenue	
SBD model	Special (Quality & Cost-based Selection)	Supply and install	Supply and install	Special (Works or S&I plus operating agreement)	Special (Works or S&I plus lease agreement)	Special (RFP & Concession Agreement)	
Partnering options		Alternative bids Value improvements Incentive payments	Two stage bidding Incentive payments	Two-stage bids or Alternative bids Target cost Value improvements Incentive payments	Two-stage bids or Alternative bids Target cost Value improvements Incentive payments	Two-stage bids	

Part 2 – Bidding Documents for PPP Contracts

Setting the Scene

2.1 Part 1 of this paper advocates a procurement methodology for publicly funded, private sector participation (PPP) contracts for small town water supply systems. The methodology is based on a partnering approach between the system owner and the contractor as parties to a single responsibility contract for the operation of the system and, as required, the design and construction of the system, or rehabilitation and expansion of an existing system (see Box A5.2.1). System ownership is assumed to be vested in the community or its representative body, although a higher-tier authority may sponsor the owner and the project to some degree defined by an agreement or executive order.. The methodology may be applied by an individual water supply system owner, or by an agent on behalf of several owners by agreement if evident economies of scale are apparent in doing so. The communities may range from 10,000 to 100,000 in population and contracts could range in works expenditure value terms from less than US\$100,000 to more than US\$3 million. Bids however are likely to be based on the water sales tariff to be charged during the operating period.

2.2 The success of the methodology will rest to a great extent on the effectiveness of the bidding and contract documentation, and the abilities of the parties to the contract and their agents. Standard bidding documents for works or services have limited applicability to the combined scope of work entailed and a special purpose document will be required. However, standard procedures are available that would support and facilitate partnering arrangements. Following is a discussion of the various contract package options and appropriate bidding procedures and documents. Special conditions of contract for system operations, maintenance and leasing purposes are discussed in Part 3.

Box A5.2.1 Single Responsibility Contract. The single responsibility contract is for a complete system, which could include design services for the permanent works, supply and installation of plant, and operating services and equipment. The system may already exist with some degree of integrity and functionality. The contract package may consist of a services-type contract with provision for a small amount of works, or it may be a works-type contract with additional services functions. The choice of contract type would reflect the relative amounts of work entailed in the services and works components, but works-type contracts should apply in cases where new construction is of significant absolute value. The scale of a typical town system suggests that a national competitive bidding (NCB) procedure may be most efficient, and opportunities would be of interest mainly to small and medium enterprises (SME), although a bundle of nearby systems may be attractive to larger, even foreign, bidders. The contractor, possibly a joint venture and probably following prequalification, would be selected through an open competitive bidding procedure using quality and price criteria to determine the lowest evaluated bid. The offer could be made in terms of the water sales tariff to be charged by the successful bidder or other basis that provides an incentive for efficient design and operation.

A tariff bid could be based in part on the capital recovery costs of new construction undertaken by the contractor, as well as a fee for operation and maintenance of the assets for the duration of the contract, which may be up to 10 years or more. The contractor would be paid for new work in accordance with an activity schedule included in the contract, and may be required to lease the system assets for an agreed fee related to recovery of the capital costs as a condition of contract. Aligning the objectives of the parties through risk and incentive-sharing arrangements, including possible revenue sharing, would encourage partnership.

2.3 Certain preliminary steps are necessary. The raw water source and system site should be thoroughly investigated and the existing system, if any, should be inventoried and assessed, including personnel resources. Any proposed works options are designed and analysed at a preliminary level by the owner's consultants following consultation with the users representatives (and donors where necessary). The aim at this stage is to define the

business case for the project and likely tariff level, assess the demand and confirm the procurement strategy.

2.4 The objectives of the selected project would be reflected in the intended functionality of the system. The important functional features of the proposed system should be clearly identified and weighted in priority to serve as a basis for bid evaluation. Complex systems with various technical options may be subject to a two-stage bid evaluation. The aim is to bring the bidders' expertise to the design and operation, so the bidding procedure should permit design proposals or alternative bids that can be evaluated in terms of the required functionality. The goal of evaluation is to establish the best-value offer, so the lowest evaluated bid price is determined on both quality and cost considerations.

2.5 In parallel with the design phase, a survey of likely bidders should be carried out to determine the capacity of the domestic sector to participate in the bidding, and establish a long list of potential bidders. The survey should take into consideration experience in other commercially oriented sectors such as power or telecommunications, or related sectors such as real estate development. This research may justify a capacity-building program aimed at upgrading SME business skills, creditworthiness and knowledge of PPP and related bidding systems.

Contract Package Options

2.6 There are two main project scope scenarios and two scale scenarios to be considered. The scope, as described in Part 1, could range from:

- management and operation of an existing system including rehabilitation and extension – a performance-based service with a small amount of works; to
- design, construction, management and operation of new system – performance-based works and services.

2.7 In both cases, the contractor may be required to lease the assets or facilities to be operated. New assets and rehabilitation measures and related process components would be designed in detail and constructed by the contractor according to a *performance specification*. Operations would also conform to performance requirements. The owner would be assisted by planning consultants to establish the performance requirements and provide information on site conditions, raw water quality, demand and other existing conditions.

2.8 The contract scale scenarios could be either an owner-managed contract for a single system or an agent-managed contract for multiple systems (i.e. a *slice and package option*). The individual system scale could range widely but it is generally expected to be relatively small and construction elements in all likelihood may be accomplished in 12-18 months or less. The owner's agent could be a contract-management specialist who would arrange for the procurement of individual systems to be contracted between the owner and contractor, and multiple systems to be contracted between a higher or joint authority and the contractor.

Best Practice Documentation

2.9 The bidding documents provide bidders with all information necessary to prepare their bids. They have two main parts – the bidding procedure and the proposed contract agreement. The procedures will include: an invitation to bid; a description of the work required and expected time schedule; and details of the bidding and evaluation process, together with standard forms for the bid offer and acceptance, and any securities required. The agreement includes: an itemized list of activities or quantities of work and the relevant specifications and standards, drawings and schedules; and conditions of contract including payment arrangements and any leasing arrangements.

Box A5.2.2 Single Point Responsibility Contract Bidding Document Provisions.

Important considerations in drafting bidding documents for single point responsibility contracts include the following:

- the bidder qualification criteria and bidding data (prequalification should be considered)
- the criteria and methodology for bid evaluation; this could entail a two-stage bidding procedure in the case of complex systems (see Annex 1)
- appropriate project information schedules (demand assessments, site conditions, raw water quality, legal framework including third-party interests)
- the contract data, including duration of the construction phase and operations phase
- the incorporation of partnering clauses into the conditions of contract, together with related schedules (membership, objectives, operating arrangements, risk management arrangements, incentive arrangements, performance monitoring arrangements)
- leasing conditions, including operations and maintenance performance requirements
- technical specifications including design, functional performance, construction standards, operations and maintenance standards
- work activity schedules for payment purposes (works-oriented contracts); unit-rate schedules (operations-oriented contracts)
- payment arrangements, including payments to the contractor for works included in the activity schedule, and payments to the owner in consideration of the lease arrangements, as discussed above, and appropriate price adjustment arrangements,
- the selection of appropriate performance security arrangements
- appropriate bid and acceptance forms, reflecting the basis of the offer (price, fee or tariff bid)

Sample bidding documents may be drafted in English for donor review. Specific bid documents and contracts should be written in the local language.

2.10 The single point responsibility contract package includes both works and services to varying degrees. Combining design, construction and operations seamlessly in a single contract requires careful drafting of the bidding documents. The range of provisions required in single point responsibility contract is listed in Box A5.2.2. Bidding document drafts can be based on a donor's SBD templates or follow established local templates satisfactory to the donor. Numerous examples of standard bidding documents embodying best practices are available as templates for works of varying scale and complexity, including supply and installation (See Box A5.2.3).

2.11 Adaptation of a SBD template to a specific contract is made using data sheets and where necessary special conditions of contract, which provide both bid and contract-specific information. However, few samples of standard bidding documents are available for water supply system management and operation, although these services will usually require as well some degree of repair and rehabilitation and possible extension works. Data sheets are inadequate to cope with this scope and type of work, and a 'special conditions of contract' will be essential at least. Moreover, those templates that are available are oriented towards international competitive bidding (ICB) procedures, and may be too complex for national competitive bidding (NCB) purposes in small towns. In the case of very small contracts, the simplest form of document consistent with the best interests of the parties may be used¹. Part 3 of this paper focuses in detail on the contract document requirements for services-oriented contracts.

2.12 It is important to recognize that the bidding documents to be used in practice should be drafted in the local language and simple terms. Contracts should be prepared in a

¹ The World Bank SBD for Procurement of Simple Works (Trial Edition), Washington D.C. 2000 is suitable for low-value, short-duration and low-risk works. Useful model bidding documents for small water systems operation following NCB procedures have been developed with Bank assistance in Ghana and Uganda. Alternatively, a useful guide to very small works procurement documentation is available on the World Bank website: see N. Khan, Manual for Conducting Very-Small Procurement Under World Bank/IDA Small Grants Loans and Credits, IBRD (ECA Region), Oct 2001.

consistent, seamless form and, to the extent possible, be grounded in legal certainty and familiarity to the parties. The procedure to be used is likely to have to conform to the donor's procurement guidelines, national procedures notwithstanding. In the case of World Bank assistance the principles to be followed are described in the 'Bank-financed Procurement Manual' (currently in draft but accessible on the World Bank website). The following sections draw on or refer to this source where appropriate but mainly focus on changes and additions necessary for PPP procurement.

Box A5.2.3 – Standard Bidding Documents. Numerous samples of standard bidding and contract documents are available for works or goods contracts of various sizes, including the suite of Standard Bidding Documents maintained by the World Bank for mandatory use as templates by its Borrowers. The World Bank's standard documents are designed mainly for ICB and adaptations to particular circumstances (including national competitive bidding or NCB) are made through the use of special conditions of contract and, for PPP, through two-stage bidding procedures. If World Bank ICB procedures are used, the relevant standard ICB document must be used in its entirety with any contract-specific amendments incorporated as special conditions and an English language version must be available.

In the case of *works*, for example, the following SBDs may be suitable: (a) World Bank SBD for Procurement of Works, Washington D.C. Mar 2003; (b) Supply and Installation of Plant and Equipment, Washington D.C. Mar 2002 (for large scale works); or (c) Procurement of Smaller Works, Washington D.C. 2003 (suitable for contracts less than \$10 million). In the case of *management and operations services* where extensive works are required in addition the World Bank SBD for Performance-based Management and Maintenance of Road Networks, Feb. 2002 may be a relevant model. The World Bank Standard Request for Proposals, typically used for selection of consulting services, are designed for recruitment of intellectual and advisory services, and are not suitable for services based on measurable physical outputs.

Contract Objectives – Services or Works?

2.13 The document contents will differ in detail according to whether the scope of PPP will include just management and operation of an existing system, i.e. *services*, or will also include design and construction of significant system assets, i.e., *works*. The documents may also differ according to the scale of the work package; small packages are generally well served by short simple documents, while large packages carrying greater risks warrant more extensive provisions. Many aspects of the various documents will be similar. The main differences are discussed below together with special features of relevant common provisions.

2.14 Management and Operations Services. This services contract option applies when the expected quantities of construction works and equipment is relatively small. The basis for bidding will depend on the evident condition and functionality of the existing assets in relation to the objectives of the contract. Partnering methods are of least impact in services type contracts.

2.15 When the system is well documented and has a proven performance (but again, when new works are quite limited in relative and absolute amounts), bids may be made on the basis of a multiplier to the current tariff, in which case the contractor may take a leasehold interest in the assets and receive the tariff revenues, being responsible for any repairs and rehabilitation costs. When the system is exposed to debt this could mean that a subsidy is required by the contractor or that revenues are shared. Investment in new assets included in the contract would be financed by the owner and provided by the contractor according to a schedule of rates.

2.16 In cases where the system condition cannot be proven and its costs are sunk, bids may be called on the basis of a fee-for-service, together with a schedule of rates or *pro forma* bill of quantities for construction inputs as ordered from time to time (a target-cost approach as discussed below may also be suitable). In this case, the owner has outsourced the services, and would receive the tariff revenues and decide on any investment expenditure.

2.17 Leasing arrangements may be incorporated into the contract as special conditions. Leasing conditions including operations and maintenance performance requirements are discussed in Part 3.

2.18 Works and Services. When significant capital construction is required then works-type procurement procedures should apply together with relevant elements of the services bidding and contract documents, so that the focus of the contract is on an integrated responsibility for design, construction and operation according to performance criteria. The contract duration will consist of a construction phase of up to two years and an operations phase of some 5-10 years or even more. The contract provisions must be able to cope with the different relationships and requirements of these phases.

2.19 In larger-scale contracts, standard bidding documents for smaller works or ‘supply and installation of plant’ may be adapted for procurement on a single responsibility basis. These adaptations would be mainly supplementary special conditions of contract that cover design responsibilities and management and operations aspects including leasing arrangements if required. In the case of very large contracts a separate lease agreement may be advantageous. In smaller-scale contracts, a suitable local SBD works template may be adapted similarly.

2.20 Bid offers would be based on a tariff bid and a price for new works. In cases when the demand is unpredictable or tariffs are subsidized, the bid offer might be made on the basis of a fixed fee or share of the expected revenues. The cost of new works would be borne by the owner and the cost of repairs and maintenance would be the responsibility of the contractor. It is practical to use a lump sum payment arrangement for the new works based on an activity schedule rather than a detailed bill of quantities.

Bidding Procedures for Single Responsibility Contracts and Partnering

2.21 Advertising. Availability of the specific bidding opportunities should be widely advertized nationally and locally in order to maximize competition. A general procurement notice should be issued locally in good time beforehand to allow bidders to register their interest, form consortia and avail of training courses that may be available to help them in cost estimation, tariff analysis and bid preparation, as well as partnering techniques.

2.22 Pre-qualification. In view of the multiple skills required to design, construct and operate water supply systems, it is desirable to pre-qualify bidders to ensure adequate capacity and experience. This places an additional bidding cost on bidders that may be seen as anticompetitive, but no ‘entry fee’ (formal or otherwise) should be charged to interested applicants as a condition of selection. In the event that pre-qualification is not used, appropriate criteria for post qualification should be included in the bid documents. Suitable qualification criteria are discussed in Box A5.2.4.

Box A5.2.4 Contractor Qualifications. In view of the multiple skills required to design, construct and operate water supply systems, it would be desirable to pre-qualify bidders to ensure adequate capacity and experience. This however places an additional cost on bidders that may be anticompetitive. The limited financial means of domestic private bidders reduces the number of bid attempts that can be made unless a reasonable success rate is achieved. In the event that pre-qualification is not used, then appropriate criteria for post qualification should be included in the bid documents. Usual key criteria for pre or post qualification include:

- (a) Evidence of relevant past experience and an annual turnover of at least equal value to (or preferably 2-3 times) the value of the proposed works over the last 2-3 years;
- (b) Evidence that the firm has adequate qualified management, technical and skilled staff, and access to relevant heavy equipment appropriate for the work;
- (c) Evidence of sufficient financial resources to amply cover the likely peak working capital needs of the contract;
- (d) Evidence that the firm is not currently involved in a legal suit over work it is responsible for.

Where a contractor is permitted and intends to subcontract major portions of the work, similar information should be provided for the principal subcontractors involved.

2.23 Instructions to Bidders. The bidding documents should clearly define the bidding process and notify bidders precisely what they need to do in order to submit a compliant tender and what will happen to the bids once they are submitted. Bidders should be allowed ample time to prepare and submit their bids – 90-120 days or more may be appropriate in view of the complexity of the scope of services required. The bidding instructions should set out:

- The timetable that bidders must adhere to for bid submission;
- The time and place of bid submission and bid opening;
- The required form of tender (sealed envelope, bid form, number of copies);
- Details of any bonds and guarantees required of bidders;
- Details on what bids should contain;
- The precise criteria on which both compliant and variant bids will be evaluated; and
- The period during which the bid offer is to be valid (typically 90 days, or longer if bid evaluation is complex).

2.24 Bidding Information. Bidders should receive the same, complete information, including the Owner’s contractual, financial and technical requirements. Information for bidders should include:

- A detailed description of the project;
- Detailed, independently validated underlying demand forecasts and revenue projections, with assumptions and methodology used;
- Survey reports including any detailed soil or ground conditions and raw water tests that may be relevant or any detailed environmental assessment of the project site or service area;
- Legislation, existing and proposed, that will affect the project, including any applicable environmental regulations or guidelines;
- A draft contract agreement with general conditions that will confirm the offer and acceptance and include: (i) a technical performance specification, relating to both construction and operations, (ii) an activity schedule indicating the amount of construction work to be performed by the contractor and the method of measurement and payment to be used, (iii) special conditions pertinent to the operational performance requirements, and (in cases where the contractor will lease the assets) leasing terms and related fee payment schedule, and (iv) a partnering agreement;
- Full details of the government’s proposed support for the project; and
- Details of any external support agreed for the project.

2.25 Bid Offers. The bid offer is the fee required by the bidder for the services to be provided. Bid offers may be price-based (reflecting outputs) or cost-based (inputs). Where management and operation services are the main focus of the contract scope and a water sales tariff is already defined, the bid offer is usually price-based, made in terms of the amount of support required by the contractor. This can be either: (a) a fixed fee-for-service; or, (b) in cases where the contractor leases the assets, a share of the revenues generated by the scheme. In strong business cases where support is not required, the offer is reversed in that a fee is paid to the owner on a fixed or revenue-sharing basis. The fee or revenue share can be stated in terms of a proposed water sales tariff or fraction of an existing tariff. In cases where the scope includes substantial design and construction responsibilities, a mechanism for obtaining a cost for those works for payment purposes is also necessary. This cost can be included in the offer and evaluated together with the fixed fee offer or, when revenue-sharing offers are required, used simply as a reference for payment purposes². The fee structure can embody risk sharing arrangements as discussed in Box A5.2.5.

² In a revenue-sharing bid the bidder must estimate the revenue potential of the scheme with due allowance for the tariff level and debt service or depreciation requirements which will be a function of the cost of the new works.

Box A5.2.5 Bid Offer Structure and Risk Allocation Bid offers that are tariff-based may be structured into fixed and variable components to provide for sharing of certain risks between the contractor and owner. Key risks are that volumes sold and revenues received may be lower than anticipated by the demand estimates (which are provided typically by the owner although subject to verification by the bidder). Despite risk-management measures, the owner's aims and policies may lead to system over-design, particularly in the initial years of operation before marketing measures can take effect. This could cause an excessively high fixed-cost element in the tariff (i.e. the lease fee), and overstate the variable (operating) cost requirements. A mechanism to detect significant deviations in demand may be necessary in order to adjust the agreed tariff from time to time consistent with actual conditions. Without provision for adjustment, the bid price is likely to include a significant risk premium, thereby further reducing the affordability of the supply and creating the possibility of a windfall profit for the contractor. In the absence of a risk premium, there is a high likelihood of default by a contractor faced with insolvency.

Small deviations in demand should be to the contractor's account but large, sustained deviations (e.g. more than 20 percent for one year or more), which would significantly erode the long run profitability of the scheme, should be the basis for a 'compensation event'. This could take the form of a reduction in the lease-fee component (meaning that the owner would provide an equivalent subsidy) or an increase in the tariff (bearing in mind the negative effects of an increased price on demand). Alternatively the lease fee payments may be staged, with a lower fee at the outset, which could reflect a corresponding grace period in the loan repayment obligations of the owner.

2.26 Cost-based offers may have application in management and operations contracts (and in some construction contracts) of uncertain content and should take a 'target cost' form³ with incentive mechanisms. For control of costs, an agreed, realistic budget limit is set for the works costs together with a formula for the sharing of cost overruns or savings. In setting the target, certain risks may be excluded from the contract.

2.27 Bid Evaluation. Regardless of how well the other steps in the procurement process are conducted, if bids are not evaluated correctly and fairly, the process has failed. A standard format and methodology for evaluation is prescribed by the World Bank,⁴ including a check list for bid opening. Unfortunately, bid evaluation is the step that is most easily manipulated in favoring a particular bidder. For this reason confidentiality is imposed after the deadline for receipt of bids and is maintained throughout the evaluation process until announcement of the award of contract.

2.28 Evaluation procedures for PPP bids would be 'value based', i.e. evaluated using quality and price considerations, as discussed in Part 1. The procedure will differ according to whether a one-stage or a two-stage bidding process is used.

2.29 The advantages of the two-stage process (described in more detail in Annex 1) include the ability of the employer, during the first stage, to interact more extensively on technical matters with bidders than is permissible in a one-stage process. In this way, an employer can learn from the market and adapt the requirements to achieve best value. A two-stage process allows an employer to state the requirements in the first stage in more general

³ When the work is both urgent and undefined (e.g. emergency reconstruction, or when time objectives outweigh cost) a simple cost reimbursement contract may be useful. Under a cost-reimbursable contract the contractor is paid the actual costs incurred plus a fee, which may be fixed or a percentage of the costs incurred. However, the method may suffer from the lack of incentive to the contractor to control costs. Close supervision is required together with transparent cost accounting and financial forecasting by the contractor.

⁴ World Bank. "Standard Bid Evaluation Form for the Procurement of Goods and Works" Washington D.C. April 1996

Box A5.2.6 Bonds and Guarantees. Bonds and guarantees are common forms of security required in construction contracts as a means of risk sharing between investor and contractor. Performance securities can in theory be in the form of conditional bonds or unconditional bank guarantees. The nature of the security influences its cost. Current World Bank practice favors “on demand” or unconditional securities, which are relatively costly compared with conditional bonds, and by their nature, one sided and confrontational. Callable securities are similar to letters of credit and the stated amount must be paid immediately to the beneficiary at the request of the owner when prescribed defaults occur. Conditional bonds on the other hand typically provide sureties with three possibly lower-cost options: (a) completing the contract through the contractor by taking up the contract; (b) selecting a new contractor to take up the contract directly with the owner; or (c) allowing the owner to complete the work with the surety paying the costs. In practice only bank guarantees are available in some countries, requiring bidders in effect to have significant collateral assets. Elsewhere insurance companies and other financial institutions commonly act as sureties in the case of conditional bonds.

Domestic regulations may require the amount of bid securities to be 1% to 3% of the bid price, and performance bonds to be about 10% of the contract price, providing room to adopt lower amounts. By way of contrast, in the USA, federal law requires conditional security equivalent to 100% of the contract value for all contracts over \$100,000, although SMEs in the USA have access to a securities guarantee program that provides cover for about 70% of the required security. In the UK, government policy regards nominal bonding requirements as potentially anticompetitive and unnecessarily costly, and recommends a selective risk assessment prior to setting security amounts. World Bank practice does not insist on bond or guarantee provision in very small contracts (i.e. less than \$25,000) other than for advance payment guarantee purposes.

functional terms than the detailed functional and technical requirements necessary to carry out a one-stage process. Knowing the bidders and their technologies prior to the second stage reduces the burden of preparing detailed, comprehensive functional and technical requirements.

2.30 Bid, Performance and Retention Securities. Standard bidding documents typically require various securities to be provided by the contractor as a guarantee of satisfactory performance. These may include a bid security, a performance security and securities to cover cash amounts advanced to the contractor or withheld for performance guarantee purposes. Securities may be certified checks, bank guarantees or bonds issued by acceptable sureties, although some forms may not be feasible in some countries (see Box A5.2.6).

2.31 In view of difficulties in obtaining credit on reasonable terms for many domestic contractors, required securities should be set at the minimum level consistent with the actual risks predicted. If pre-qualification is used, bid security (aimed at avoiding capricious bidding) could be dispensed with. The performance security and retention security or withholding requirements should be considered together and where risk management measures are in place should not exceed in total 10% of the contract value. In the event the contract is to be with a general contractor with a limited direct input to the work, then the performance security arrangements should be passed through to the main subcontractors with the beneficiary designated as the employer. Amounts would be prorated to the value of the subcontractor’s contracted amount and to the sponsor’s contracted overhead amount.

2.32 Should an operating contract be awarded to the construction contractor, an operating performance security may be required and should be designed on a gradually reducing basis over the life of the operational phase. The early operational phase amount should be considered together with any overlapping construction security/retention security requirement in light of the anticipated operational risks.

Slice-and-Package Bidding

2.33 The World Bank Procurement *Guidelines* (Clause 2.4) recognizes that projects requiring a number of similar kinds of works could invite bids under alternative contract options that would attract the interest of both small and large firms, which could be allowed, at their option, to bid for individual contracts (slices) or for a group of contracts (packages).

Box A5.2.7 General Conditions of Contract. Standard forms of contract play a dominant legal and management role in contracting methods within the construction industry, intended to introduce fairness and standardize rights and obligations. General Conditions of Contract (GCC) for works typically follow well known, worldwide standards established by international bodies such as, FIDIC¹ or the UK Institutions of Civil Engineers (for civil works including plant) or Chemical Engineers (for process plants). The drafting bodies are made up of a range of relevant disciplines. The GCC define the parties, their respective rights and obligations, and the contract management arrangements including provisions for control of quality, time and cost of the works or services required, as well as measures for resolving disputes and the remedies available in case of default by either party.

The *Federation Internationale des Ingenieurs-Conseils*. (www.fidic.org) “Conditions of Contract for Works of Civil Engineering Construction” (Red Book) is the template used to develop the World Bank’s SBD general conditions. Also available among others are the FIDIC “General Conditions for Plant and Design-Build” suitable for engineering works designed by the contractor, and “Short Form of Contract” (which is the basis of the World Bank’s SBD for ‘Simple Works’). Of particular interest for PPP contracts with partnering is the suite of options available in the new ‘Engineering and Construction Contract’ published by the Institution of Civil Engineers, UK (www.ice.org.uk) which has simplified much of the contract language and draws on modern project management principles. The GCC contained in the World Bank SBD for Performance-based Management and Maintenance of Road Networks would, with appropriate sectoral reorientation, be generally applicable to outsourced service type contracts.

All bids are received by the same deadline and evaluated simultaneously so as to determine the bid or combination of bids offering the lowest evaluated cost to the owners concerned. This approach could apply best when evaluation criteria are simple. Value-based bidding, as is desirable with a partnering approach, would be more complex in a slice-and-package arrangement and a two-stage evaluation method would not be practical in such circumstances.

Contract Documents

2.34 Following the concurrence of the donor and sponsor with an interest in the financing of the contract, the owner may enter into a contract with the winning bidder. The contract should be consistent with the bidding documents and the accepted bid submitted by the winning bidder. A typical contract will include:

- The contractor’s bid, including the proposals for the rates of payment for the works;
- The employer’s letter of acceptance (the contractor’s offer and this acceptance constitute a legally binding agreement);
- The Contract Agreement confirming the offer and acceptance;
- The Conditions of Contract, including any special conditions of contract;
- The Technical Documents (drawings, specifications, site information);
- The Schedules of Activity Payments, Lease Payments, etc.

2.35 Conditions of Contract. The General Conditions of Contract (GCC) typically follow well-known, worldwide standards (see Box A5.2.7). Such standard GCC however do not usually envisage a consequent management and operation function for the contractor or partnering arrangements⁵ so, in such cases, it is necessary to supplement the GCC with special conditions (SCC, sometimes referred to as ‘conditions of particular application’) covering these services, and with related payment and leasing terms. Corresponding changes are necessary to the Contract Data Sheet.

2.36 The SCC are used to modify or expand the GCC. Direct amendment of the GCC is not recommended as a general rule in order to avoid confusing or misleading users familiar with the GCC, which are often standardized worldwide. Most GCC are concerned with works contracts and must be supplemented in the case where the design of permanent works,

⁵ An addendum to the ICE Conditions of Contract is available for partnering purposes.

and management and operations services are included in the works or when a lease is part of the contract conditions. The clauses to be included will depend partly on the form of GCC used, as discussed in Part 3. The structure and terminology of the SCC should be consistent with the GCC but in application the SCC takes precedence over the GCC. The GCC and SCC are not prescriptive in technical terms - that is the role of the technical specifications.

2.37 Technical Specifications. Clear performance and technical specifications are prerequisite for bidders to respond realistically and competitively to the requirements of the employer without qualifying or conditioning their bids. Specifications should be drafted to permit the widest possible competition, and at the same time make a clear statement of the required standards of workmanship to be provided, standards of plant and other supplies, and performance of the goods and services to be procured. In the interests of obtaining best value from domestic bidders, the technical requirements and specifications may reflect local standards for workmanship and material quality or services where appropriate.

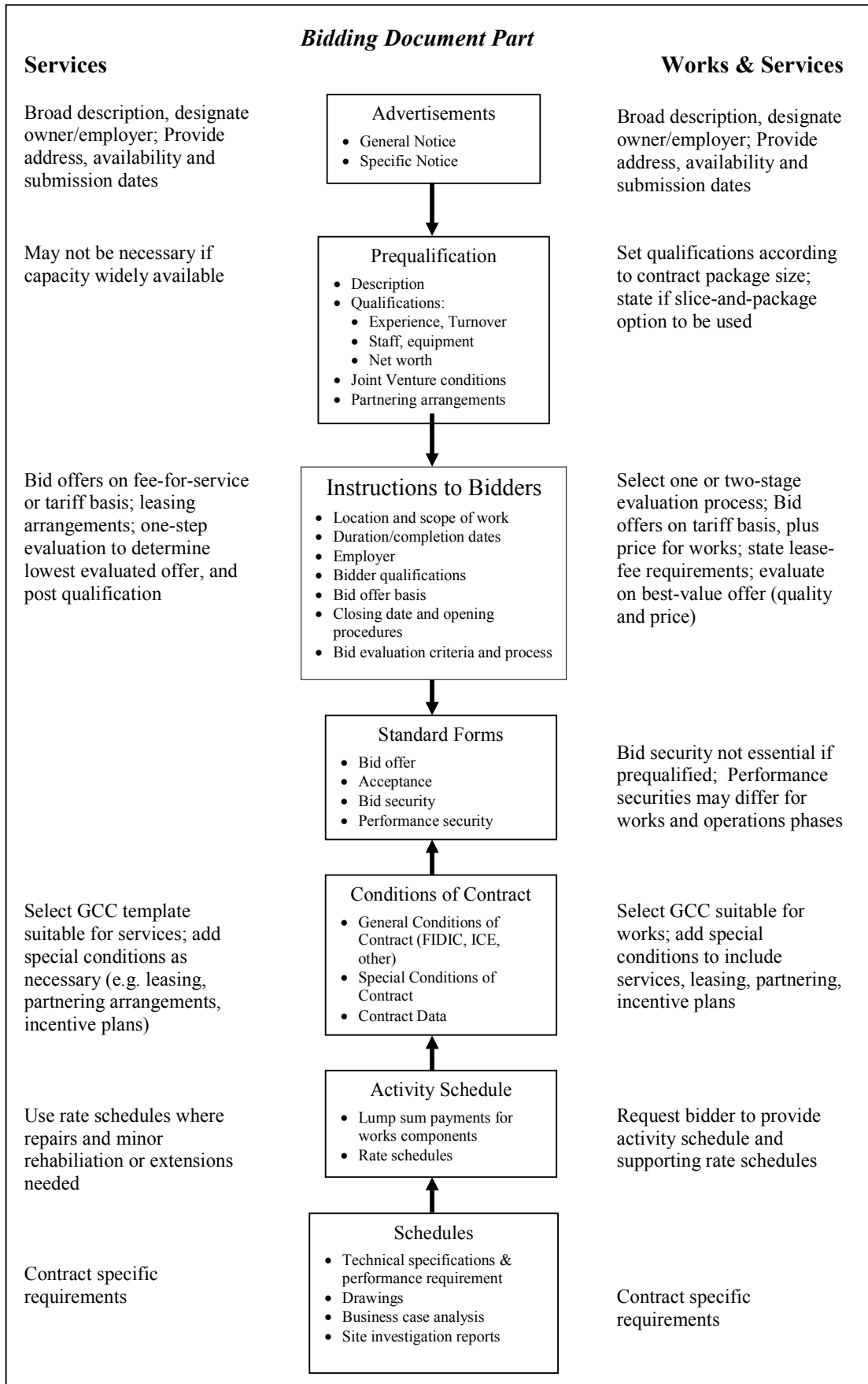
2.38 Partnering Arrangements. The special conditions of contract would define the partnering arrangements and provisions. Definitions of the partners, their partnership governance arrangements (objectives, working arrangements, obligations, and dispute-resolution mechanisms), and the risk management and incentive arrangements, should be clearly set out in schedules to the contract, or defined in the special conditions where appropriate. The partnering agreement would not normally take precedence over the respective bi-party agreements among the partners.

2.39 Payment Terms. When construction work is undertaken, lump sum payment arrangements are most suitable for single point responsibility contracts where the contractor is responsible for the detailed design⁶. Lump sum payment for work done is typically made according to the achievement of certain targets of progress (20% complete, 40%, etc) as reflected in the activity schedule. Variations ordered by the owner are usually valued separately by negotiation in adjusting the contract price. Variations are often simpler to value where a priced bill of quantities is used. The bidder may be required to prepare a rate schedule to support any lump sum as part of the bid.

2.40 A portion, typically 10 percent, of each interim payment due is generally retained by the employer (known as ‘retention’ or ‘withholding’ amount) and released in part (typically one half of the retention amount) on the issue of the defects liability certificate and in full on the issue of the completion certificate, usually following a one-year warranty period. In view of the contractor’s operational responsibilities and performance security, and the contract incentive structure a retention provision may be redundant.

⁶ The contractor is paid for the actual amount of work done, usually on a monthly basis to assist with cash flow. In price-based contracts, two alternative forms of payment arrangement are generally used – (a) re-measurement against a priced bill of quantities; or (b) lump sum payments against a schedule of activities. Re-measurement approaches are typical when the works have been predesigned in detail and is most useful for interim payment purposes and when variations to the scope of work occur, e.g., due to unexpected ground conditions or design change orders by the employer. Variations in the amount of work are valued at the competitive rates tendered by the contractor. Despite these advantages, re-measurement can be a considerable administrative burden and source of dispute between the parties.

Figure 4 – Bidding Document Formulation Process



Part 3 – Contract Conditions for System Management and Operations

Management and Operations Options

3.1 The *single point responsibility contract* includes significant operational services functions in addition to construction services. Operational services would include detailed design, system operation and maintenance, billing and collection, record keeping and performance monitoring and reporting, together with management and accounting. These services could apply to an existing system or to a new or rehabilitated system acquired under the same contract. Management and operations services contracts, as discussed in Part 2, entail provisions and conditions different from those typically found in works contracts. This Part focuses on those conditions and terms relevant to management and operations services that would be required in conjunction with a works contract. The provisions and terms could also be used to develop a stand-alone contract.

3.2 The services may be procured where significant works are not required as an outsourced service or, more likely, in conjunction with a lease agreement. In an outsourced contract format the contractor would be typically paid a fee-for-service, independent of the system revenues. When the system is exposed to debt, however, there is a need to ensure that revenues are adequate to cover debt service as well as operating costs and profits. In cases where the system is clear of debt, it is still good practice to ensure that revenues cover system depreciation. Consistent with the single point responsibility concept, leasing creates the condition for an added incentive to the service contractor to increase system revenues where these would be shared between the owner and contractor. Revenue maximization is partly a matter of volume sales and production efficiency. Production efficiency can be highest when the service contractor is also responsible for the design and construction of the system. The lease agreement would incorporate the management and operation provisions, and incentive arrangements.

3.3 The technical requirements and standards applied to management and operations are a matter of technical specification. While the technical specifications are a key part of the bidding and contract documents, the following discussion of relevant terms and conditions applies for procurement purposes to the bidding procedure and the conditions of contract. The reader must look elsewhere for a complete treatment of management and operational policy and practice for a water supply system.

3.4 The approach recommended in Part 2 for bidding and contract document compilation envisages the management and operations provisions, together with any leasing requirements, to be incorporated into the special conditions of contract applying to a standard works bidding document. It is important therefore to understand what aspects of the works bidding documents would apply to the operations phase, and what needs to be changed, and what needs to be added. First it is important to be clear about the objectives and scope of the management and operations services.

System Management and Operations Objectives

3.5 The objectives of the contract would include the management, operation and maintenance of the system in all aspects (see Box A5.3.1 for an example of comprehensive services required in a recent Philippines contract) in the designated service area for the duration of the contract, e.g. 5 years, 10 years, etc. The standards to be observed in carrying out the services may be defined in terms of national standards for drinking water quality, environmental protection, building management, engineering services, health and safety, etc, and performance standards as well as particular requirements specified in the technical

Box A5.3.1 Management and Operations Services Required may include the following:

- the collection and treatment of raw water;
- the supply, transportation, distribution and marketing of potable water to customers in the service area;
- all corrective and preventive maintenance of the facilities;
- all water quality sampling, testing and monitoring to ensure compliance with the applicable law;
- all aspects of metering, billings, collections and customer service related to the provision of potable water to customers;
- all corrective and preventive maintenance of vehicles and equipment used in carrying out the management, operations and maintenance of the facilities and billings and collection;
- the maintenance of appropriate health and safety conditions related to the facilities;
- the management of all staff training and development;
- the management, maintenance, updating and organization of all standard operating procedures and their documentation for the facilities;
- the management, maintenance, updating and organization of all operations and maintenance manuals for the facilities;
- all aspects of the management, operations and maintenance of inventory, including all spare parts and consumables;
- The management of all accounts, financial statements and audit reports pertaining to the services;
- the management of all lease records and other data, records and information related to the activities being carried out by the Operator; and
- the construction and management, operations and maintenance of any extensions to the facilities.

Ref: Philippines LGU Urban Water and Sanitation Project

specifications. The extent of the operational terms and conditions will relate to the system scale. The extent to which the services would be combined with works should be defined. This may range from rehabilitation and minor extensions through to a complete new facility.

Integration with SBD Conditions of Contract

3.6 The GCC must be supplemented to cover any leasing arrangements and add the provisions necessary to cover system management and operations. In addition to many of the general provisions, some of the specific provisions may be already addressed to varying degrees in the selected standard template. The adaptations may be made in some instances through appropriate bidding or contract data entries, or may require Special Conditions of Contract (SCC). Box A5.3.2 provides some examples of SCC clauses required for leasehold operations purposes in context of the GCC included in the World Bank's SBD for Smaller Works. The full clauses are presented for reference purposes in Annex 3.

Leasing Arrangements

3.7 Common features of a lease agreement would be a covenant by both parties to enter into such an agreement for a defined period subject to considerations such as the respective rights and obligations of the parties including the services to be provided by the lessor, related financial responsibilities and payment arrangements, dispute resolution and termination arrangements, and indemnities and insurances.

3.8 Rights and Obligations. In the context of the required services, the obligations and rights of the contractor and employer under the contract should be clearly defined, including payment arrangements, dispute resolution arrangements and performance default triggers. Risk allocation and responsibilities should also be defined. The obligations and rights will vary according to whether the contractor will lease the assets or simply operate them on

Box A5.3.2 Integrating GCC and SCC for Operations. In the case of SCC applying to operations required under a leasing arrangement in conjunction with works to be carried out under the type of GCC included in the *World Bank SBD for Smaller Works*, new and amended clauses would be required in the following areas corresponding to the GCC structure:

- **GCC Part A - General**
 - Various definitions relating to the sectioning of the ‘works’ into a construction phase and operations phase; design of permanent works; operations and maintenance services; payment arrangements (GCC 1*);
 - Approval of drawings for permanent works (GCC 18*)
 - Third party permits and approvals (**)
 - Contractors rights during operations phase (**)
 - Restrictions on competing water supplies (**)
- **GCC Part C - Quality Control**
 - Water supply performance requirements (**)
 - Customer service arrangements (**)
 - System reinforcement and extensions(**)
 - Customer service standards(**)
 - Meter reading access rights(**)
 - Environmental protection(**)
 - Record keeping(**)
 - Reporting requirements(**)
 - Auditing(**)
 - Maintenance programming(**)
 - Defects during operations(**)
- **GCC Part D - Cost Control**
 - Construction phase payment terms (GCC 37, 42,44*)
 - Operations phase cost responsibilities(**)
 - Charging, billing and collection rights(**)
 - Tariff adjustment(GCC46*)
 - Lease fee(**)
 - Disconnections(**)
 - Penalties and Bonuses (GCC48, 49*)
 - Securities (GCC51*)

*Note: * indicates amendment to existing clause. ** indicates new clause(s)*

behalf of the owner. Contractor obligations under a lease agreement could typically include the following:

- Assume full responsibility for the services required, including their cost of provision;
- Perform to the standards required;
- Provide connections and water to authorized customers according to defined volume, pressure and duration criteria;
- Provide water for public purposes (e.g., fire fighting) free of charge;
- Provide customer services including inquiries and complaints, notices of interruptions, alternative supplies during interruptions, clear invoicing and payment receipt issuance;
- Maintain records and accounts, and provide regular reports on water production, service performance; financial performance (audited) and asset condition;
- Carry out remedial works where instructed in cases of inadequate maintenance;
- Hire competent personnel and subcontractors;
- Obtain insurance;
- Pay damages and penalties for breach of contract performance;
- Pay a lease fee according to a defined schedule;
- Pay all relevant taxes and duties;
- Provide a performance security;

- Allow inspections by the owner;
- Hand over the system facilities in good order at the end of the contract.

3.9 Contractor rights could include:

- To lease the scheduled system facilities and to have unlimited access to them including raw water sources;
- To collect charges for supply of water to customers according to an agreed tariff and retain the revenues (in whole or in part);
- To enter onto private premises for meter reading purposes;
- To disconnect customers in arrears or supplying water to others illegally;
- To make extensions and reinforcements to the system at own cost;
- To seek regular and extraordinary tariff adjustments on specific grounds;
- To be protected from alternative service provision in the service area;
- To seek penalties and damages due to the employer's breach of contract.

3.10 Payment Arrangements. Payments due to the contractor/lessor under management and operations contracts based on a fixed fee are paid by the employer as scheduled accordingly. Under a revenue sharing contract the revenues could be placed in an escrow account and the contractor would be entitled to draw the agreed share periodically from the account. Payments due to the owner could be made similarly. Where the contractor is entitled to retain all revenues subject to payment of a lease fee, the lease payments would be scheduled.

3.11 When revenues are based on a tariff bid, the tariff would be subject to a periodic adjustment (quarterly, biannually or annually) due to changes in the contractor's variable costs beyond the control of the contractor. Adjustment would be in accordance with a formula stated in the conditions of contract and based on a suitable index (such as the CPI).

Operations Provisions

3.12 In drafting SCC clauses there are a number of options in areas such as performance standards and penalties, record keeping and reporting, repairs and maintenance, payment terms and termination arrangements that may be considered.

3.13 Performance Standards Operational performance is typically judged on the basis of customer service criteria. These may include physical criteria (volume, pressure, service continuity and disruption, connection and disconnection arrangements, losses), and commercial criteria such as billing and collection arrangements, customer-care facilities. To be meaningful, arrangements must be in place to monitor and measure performance, preferably jointly. These monitoring arrangements can be reflected also in performance incentive plans.

3.14 Performance Penalties. Sustained performance defaults when detected can be subject to remedies stipulated in the contract. Remedies could include financial penalties deducted against the performance security (Philippines), or deductions against the contractor's fixed fee (Ghana), or, in the final case, termination of the contract and confiscation of the performance security. Keys to effective sanctions are reliable monitoring, clear tolerances¹ and a reasonable consistency between the penalty amount and the damages suffered by the owner or customers due the breach. A list of records and performance monitoring reports required in Vietnam is shown in Box A5.3.3.

¹ In the Philippines example default was held to occur after 60 days failure to comply (15 days in health critical areas). Penalties were assessed as 25 percent of the estimated cost of meeting the service criteria in question. In Ghana penalties were assessed for unjustified supply interruptions more than a certain number of hours. Non-critical service failures were assessed for penalties after 30 days. In Paraguay a penalty points system was used to evaluate various types of failure. An annual accumulation of a certain number penalty points could result in penalties of 5% to 10% of the annual revenues.

Box A5.3.3 Performance Monitoring. Administrative records could include the following:

- water abstraction, treatment, supplied and consumed by calendar month
- capital works and renewals carried out by the contractor by calendar year
- routine and periodic maintenance carried out by the contractor by calendar year
- customers, consumption and billing by calendar month
- customer payment defaults, disconnections and reconnections by calendar month
- customer complaints and actions taken by calendar month
- financial transaction ledgers and financial statements in accordance with generally accepted accounting principles; and
- cost accounts relating to major functional areas of the operational services.

Performance reports provided to the Project Manager at monthly intervals including the following information in respect of the preceding month:

- Water availability in terms of hours of uninterrupted supply
- Water pressure range in terms of maximum and minimum pressure achieved daily
- Water quality in terms of the indicators in the specifications
- Facilities maintenance, repair and replacement activity.
- Service coverage in terms of the number of active service connections compared to the number of households and business premises in the service area
- Total number of service connections, and net increase/decrease from previous report period, including new connections, disconnections and reconnections
- Number of complaints received and action taken.
- Amount of unaccounted-for-water in terms of water produced compared to water sold.
- Current tariff applied to billings, and
- Number and total amount of customer accounts past due in excess of 30 days and 60 days

3.15 Repairs and Maintenance. The contractor would be fully responsible for repairs and maintenance of the facilities according to an approved plan of routine and periodic maintenance. Major equipment that completes its life cycle and requires replacement due to fair wear and tear may be replaced at the cost of the owner.

3.16 Incentive Plans and Risk Allocation. Partnering arrangements would be reflected in part by incentive plans and risk sharing arrangements for the operations phase. Box 1.5 in Part 1 discusses incentive options and related risk allocation provisions. Box 2.5 discusses structuring of the tariff fee (bid offer) to facilitate risk sharing.

Annexes:

1. Public-Private Partnering Options in Procurement Strategies
2. Risk Management
3. Typical Special Conditions of Contract
4. Procurement Strategy –Private Finance Options

Procurement Planning for Private Participation in Town Water Supply and Sanitation

Annex 1 - Public-Private Partnering Options in Procurement Strategies

Introduction

A1.1 Two important trends in public expenditure policy have significant implications for procurement practices. First is the aim to link capital expenditure plans with operational or recurrent cost implications – leading to life-cycle costing as a key consideration for investment decision-making. Second is the increasing role for private sector providers in delivering public services such as water supply. However, water supply, as a public good, is vulnerable to the inefficiencies of any monopoly whether public or private. In addition to regulation and performance monitoring, the role of competition in selection of private providers for water supply is of key importance.

A1.2 Private participation can range from outsourced services to integrated system provision and operation¹. In cases where private participation is limited to outsourcing of various functions such as design or construction services, or operational services, procurement of the contractors is conventionally undertaken through a competitive, price-based tendering process. Such processes can be quite efficient and economical in some circumstances, particularly in small simple contracts, but in many cases results are not so, suffering delay and cost overrun. The contracts used are typically prescriptive and adversarial by nature, offering little opportunity or incentive for any innovation or initiative by the contractor that could add value or result in better performance of the assets or service concerned. In many projects, procurement of asset components and operational service is fragmented, which can contribute to sub-optimal performance of the facilities as a whole.

A1.3 These problems raise particular risks for private participation contracts aimed at obtaining a ‘single point responsibility’ service covering an integrated design, construct and operate scheme. In their ultimate form, as BOT schemes, in which private investors become wholly responsible for the creation and financing of the assets as well as the commercial success of the operation, though they often achieve their performance goals, they tend to be limited to higher-income countries. This is due to difficulties elsewhere (IFC efforts notwithstanding) in mitigating country risks and obtaining the commercial financing required. Procurement in BOT and similar projects is normally the responsibility of the investor, but the partnering methods often used to achieve value are of real interest to the public sector. In low-income countries, a significant degree of public finance support is usually necessary for such projects, and a public procurement process is generally entailed. The alternative option of partnering to various degrees for this purpose is explored in this annex.

Partnering

A1.4 In the search for greater investment efficiency, leaner production costs and higher profit margins, a middle way for procurement been pioneered in Japan, USA and UK over the last twenty years. It relies on partnering between clients and suppliers to achieve shared objectives and foster better value. Partnering generally entails a commitment between two or

¹ The World Bank defines PPI cases as those which assume operating risk. Hence Outsourcing (other than for operations) and Turnkey are not full PPI initiatives but are included in this discussion in order to demonstrate the full spectrum of private involvement that could benefit from partnering.

more organizations to achieve mutual or aligned objectives through maximizing the effectiveness of all parties².

A1.5 Following the success of partnering with private sector clients having significant ‘repeat order’ business the method has evolved to fit public sector clients, including those with ‘one-off’ requirements. Success with the method was achieved gradually, in that a significant cultural change in both partners was necessary in converting from an adversarial to a collaborative process. Not all projects are suitable for partnering, as the process can increase contract complexity and overheads. Many simple low-cost projects using established technology may be better served by conventional competitive price-based tendering, although in least developed countries (LDCs) this changeover point may be quite low. Piped water supply businesses, even small ones, are multidisciplinary endeavors and good candidates for development through partnering approaches. Of key significance are the availabilities of experienced suppliers able to add value to the project and clients with appropriate managerial and technical vision and resources. However, procurement experience in LDCs is still nascent and the cultural shift entailed in partnering for many other countries may not be a significant hurdle for LDCs.

A1.6 The case of a national or regional water supply project covering numerous towns may be a suitable example for a ‘repeat order’ strategic partnership arrangement between the national sponsor and the contractor. In such a case, the partnership would also include the recipient town of each ‘order’ so that a tailored solution, also meeting the objectives of the town, would be delivered. It is also possible to envisage a highly tailored, ‘one-off’ partnership arrangement between a town and a selected contractor, piloted and refined in a number of towns, and subsequently replicated across many towns, although this approach may suffer from lower economies of scale.

A1.7 Despite its demonstrated advantages in terms of efficiency and economy, there are some characteristics of partnering that could run counter to the procurement policies of ODA agencies, such as the World Bank, which are committed to open and transparent, competitive bidding procedures based generally on the lowest-evaluated-cost selection principle. Projects which are supported by ODA funding may need to obtain a waiver from the relevant agency policy in order to use some partnering methods³. Public procurement policy itself, even in the case of public enterprises, is bound by tight budgetary considerations and traditionally is more investment-cost-focused, with value and time playing a minor role in investment decision-making and related purchasing. Moreover, combating pervasive corruption of the public tender process in many countries discourages negotiated agreements and puts a high premium on transparent and objective decision-making processes.

The Partnering Process

A1.8 Partnering as a selected procurement strategy must meet the fundamental purposes of public sector procurement as well as create the opportunity for added value and greater efficiency in the final outcome. In addition to providing a fair and open selection process, defining the obligations, responsibilities and remedies of the contracting parties, and providing clear payment and dispute resolution mechanisms, a partnering format would also include a clear understanding of the value or cost effectiveness of the project, and an

² National Economic Development Council. “Partnering - Contract without Conflict” London, HMSO 1991

³ The World Bank Procurement Guidelines (para 3.13) recognizes that ‘BOT and Similar Private Sector Arrangements’ including those for water supply systems require a special procurement procedure but stipulates this must be based on ICB or LIB procedures acceptable to the Bank. ICB guidelines (2.5) recognize turnkey, design and build, and management contracting as justifiable methods that may use two-stage bidding processes.

alignment of the objectives of the parties in an incentive or gain/loss sharing mechanism linked to an organizational method. In the context of a single point responsibility contract, the contract packaging arrangement would be key. Arrangements such as Design, Construct and Operate, Turnkey, or Target Cost would be applicable rather than the traditional route. Selection would consider both quality and price, possibly through a two-stage process. Within the contract package, the contract terms, and particularly the pricing and payment arrangements, and the dispute resolution mechanism must be aligned to fit the concepts of partnering.

A1.9 Various models for partnering are possible depending on the scale and complexity of the project. Using a small town water supply scheme as an example, and assuming that the project would be publicly financed with ODA support, and that the contractor would be required to design, build and operate the system on a multi-year lease-back basis, a possible partnering model could look as follows.

A1.10 First, the client/owner should select and engage an engineering or management consultant experienced in partnering to:

- assist in the formulation of the project concept alternatives and prioritized objectives;
- prepare preliminary designs, impact assessments, budget estimates, life-cycle costs, and financial, risk and value analyses;
- assist or represent the owner in technical and methodological discussions with the project sponsors, financiers, and the bidders and contractor;
- help select the procurement route and draft the bidding and contract documents for the tender scheme; and
- help with the bid negotiation and evaluation and the contract administration.

A1.11 Second, in selecting the procurement route, consideration is given to:

- using a single-stage or two-stage selection process;
- adopting either a price-based or a cost-based contract, with appropriate contract conditions; and
- providing for incentive payments (and appropriate damages) in the contract.

A1.12 Third, select the contractor who has the ability to deliver the best value and not simply the lowest price.

A1.13 Fourth, train the joint team and cooperate closely in the development and construction of a final design consistent with the contract terms and objectives, and providing higher value than the tender scheme. Value may be added in terms of capital or operating-cost savings, time saving or increased functionality of the facilities within the contract price.

A1.14 Fifth, share realized cost savings (or cost overruns) and increased income with the contractor according to a pre-agreed sharing formula.

Bidding and Contract Options for Publicly Financed Schemes

A1.15 Conventional single-stage price-based procurement provides limited opportunity for partnership, notwithstanding the contractor's design responsibilities, although an opportunity to submit an alternative bid can be permitted. An alternative bid allows the bidder to estimate prices for both the tender scheme and an alternative design reflecting value that can be added by the contractor. Payment terms would consist of lump sums based on activity schedules. World Bank procedure however requires that only the alternative offer, if any, of the lowest

evaluated bidder based on the tender scheme may be considered⁴. While this facilitates comparison of offers and simplifies bid evaluation, it is costly to the industry.

A1.16 Instead of (or in addition to) an alternative offer, the contractor could be permitted during the contract to offer changes to the design that would add significant value. The change would be recognized as a compensation event and payment terms would permit the contractor to share in the realized savings. Costing of such savings is however difficult without details of the contractor's cost basis for the tender scheme and the overall life-cycle cost of the project.

A1.17 A two-stage bidding process⁵ provides a good opportunity to develop the benefits of partnership, particularly in larger schemes with diverse technical content, a mixture of product and service requirements, and strong commercial objectives where the contractor is expected to carry substantial risks. In the first stage, bidders are asked to submit a technical proposal for the scheme as outlined by the owner in terms of its functional requirements. The different proposals are assessed through a structured examination on their technical merits alone, without price as a factor. Based on the outcome of the proposals, as a second stage, an amended bidding document is prepared for pricing by the responsive first-stage bidders and evaluated against specified criteria which may include non-price factors as well as price. A schematic presentation of a two-stage process is given in Figure 1. Payment could be on a lump sum basis with activity schedules, or on a target cost basis. Improvements to the design can be permitted during the contract as described previously.

Incentives and Damages⁶

A1.18 Positive incentives included in the contract are key to motivating the contractor to achieve certain targets of mutual benefit to both parties and are an important means of aligning the business objectives of the contractor to those of the owner. The targets could be a level of performance over that contracted for in terms of, say, lower life-cycle cost, increased functionality or shorter construction time. This implies that the contractor's profitability increases for superior performance and decreases for poor performance. Incentive plans may be single-incentive or multiple-incentive systems, but require careful consideration. Reductions in capital cost that raise operating costs commensurately would not be of long-term benefit (hence the need to evaluate improvements in terms of life-cycle costs). Naturally, the value to the owner in achieving the target must be greater than the incentive payment to the contractor, which in turn must be greater than the cost of achieving the target. The benchmarks and targets of any incentive plan must be realistic and transparent, and the contractor must have reasonable control over the risks entailed. Measurement of performance should be quantifiable and capable of being monetized.

A1.19 A suitable form of single incentive in water supply works could be to share savings in contract price (capex) and/or operating cost (opex) that would make a tariff reduction possible. The ratio of shares would be defined to motivate the contractor but with the relative

⁴ Current proposals for revision of the WB Procurement Guidelines would allow owners to request and evaluate all alternatives provided that the bidding documents are transparent in regard to the format and pricing of alternatives, and the evaluation methodology.

⁵ Two-stage bidding is currently recognized by the World Bank as an option for ICB procurement and the Bank has issued standard documents for two-stage complex IT system procurement.

⁶ 'Damages' refers to the reasonably quantifiable costs that the owner might suffer due to breach of contract by the contractor, say due to delay or inadequate functional performance. Damages are distinct from penalties that the owner may wish to apply in cases of underperformance by the contractor. In many legal systems however penalties are not enforceable unless corresponding bonuses are available for superior performance.

financial strengths of the owner and contractor in mind, such that the quantifiable benefits could be shared, say, 80:20.

A1.20 While positive incentives have been generally successful, negative incentives, according to the literature, appear to be counter-productive because they encourage the contractor to avoid the problem rather than solve it constructively, or even to walk away from the contract. Moreover, the philosophy of shared gains implies that pains should also be shared. Liquidated damages for delays or lower functionality (e.g. higher than expected energy consumption) should also be realistic and measurable.

Contract Documents

A1.21 The World Bank requires Borrowers to use its Standard Bidding Documents with minimal changes, but none have yet been developed as standards for use in small-scale partnering contracts⁷. Numerous published forms of standardized documents for use in conventional procurement routes are available, offering different degrees of flexibility to adopt various partnering options. Few are published (widely at least) for design, construct and operate contracts with their mix of product and service requirements, or involving partnering⁸. Various *ad hoc* efforts have been made on a project basis to develop suitable documents for private participation (without partnering) in small to medium-scale water supplies (e.g. Philippines, Vietnam, Ghana, Uganda, and Paraguay). For partnering purposes a special bid and contract document would need to be developed using these or other samples as used elsewhere. Partnering clauses could include:

- Alternative bid evaluation
- Two-stage bidding arrangements
- Definition of partnership arrangements
- Staff partnering training schedules
- Payment and incentive arrangements (cost-based)
- Value-based change procedures, benchmarking
- Value improvement evaluation and compensation sharing
- Damages (loss-sharing arrangements)

A1.22 Experience shows that the cultural and skill changes required to maximize partnering results will not happen unless the people involved are motivated to change. Training, facilitation and periodic reinforcement will be necessary to aid the change process and should be planned for as part of the bidding and contract process.

A1.23 Concession agreements for utility management and operation involving major capital expenditures by the contractor (such as BOT) are procured differently from publicly financed contracts, but typically would follow a two-stage procedure aimed at obtaining the lowest tariff. However, in many cases BOT offers are unsolicited and the agreement is negotiated.

For Further Reference:

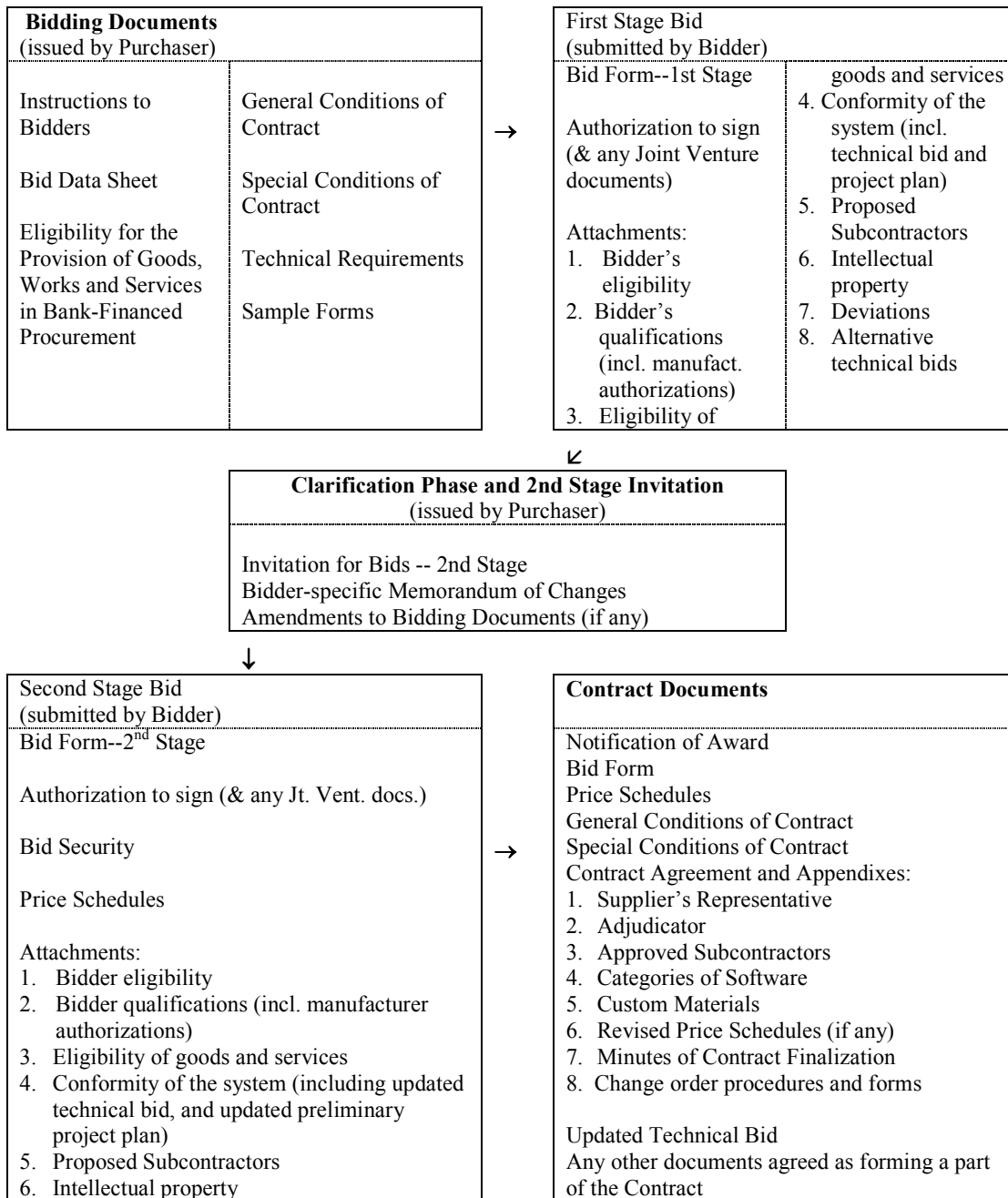
IFC Financing Private Infrastructure, Lessons of Experience #4, World Bank, 1996
Broome J. Procurement Routes for Partnering, Thomas Telford, London, 2002

⁷ SBDs are available for performance-based Management and Maintenance of Road Networks, and for Supply and Installation of Information Technology Systems that have relevance to the Water Supply sector and partnering options. Adaptations of ICB documents using two-stage processes have been developed in the power sector, which could be of direct relevance to the water sector.

⁸ The New Engineering Contract series published by the Institution of Civil Engineers (UK) is a case in point. Moreover, ICE has published an addendum to its well known General Conditions of Contract (7th Edn) providing partnering clauses. The ICE Conditions are the historical basis of the FIDIC Conditions, which greatly influenced the Conditions adopted in various World Bank SBDs for Works.

Two-stage Bidding Process Flowchart⁹

[excludes pre-qualification (if any) and advertisement/IFB process steps]



⁹ Adapted from World Bank Standard Bidding Document IS2STG-V3a-Mar 30, 2003

Procurement Planning for Private Participation in Town Water Supply and Sanitation

Annex 2 - Risk Management

A2.1 Three separate phases of risk are usually associated with private investment in public utilities:

- the construction phase risks, including design inadequacies, cost overruns, poor ground conditions, land acquisition delays, accidents and contractor defaults;
- the start-up phase risks, including functional underperformance, organization weaknesses, marketing deficiencies, demand underestimates; and
- the operating phase risks, including revenue shortfalls, sales shortfalls, deteriorating raw water quality, inadequate maintenance, legislative changes, accidents, and contractor default.

A2.2 The risks if realized would conspire to increase costs and/or reduce revenues compared with the business case expectations. When the impact exceeds the sensitivity allowances the business may become insolvent and fail. Understanding the project risk profile and the ability of the parties to manage or mitigate the risks is essential. The exposed parties are the owner, contractor and financier. Risks can carry a low probability and high impact, and vice-versa, affecting each party differently in view of differing capacities to absorb the impact of the risk. Parties that cannot control risk allocated to them will charge a premium for doing so. Planning to minimize and mitigate risks is important in reducing project costs and realizing benefits.

A2.3 A risk management plan begins by identifying the risk profile of the project and assessing the likely causes, their probability and possible impact. If risk is not identified it cannot be managed. Risks may have a beneficial outcome in some cases (e.g. risk of underestimated demand). Evaluation of risk impacts can be made using the financial or value model developed in project planning. Mitigation of risks is achieved through elimination where possible or reduction, by transfer to insurers or allocation to the party best able to control and bear the impact, or by avoiding them. Allocating the residual risk most efficiently is important in controlling costs (see Risk Event and Allocation Matrix below), but the party concerned should have an active program aimed at monitoring and controlling the risks concerned.

A2.4 For the financier, assurance that debt service obligations will be met is paramount. This risk may be mitigated by use of escrow accounts and mortgages on the system assets. The owner may set off the financial risk to the contractor who would carry the construction costs and operations costs risks to a large extent. Some aspects of these risks (e.g., accidents, damage) may be further set off through insurance or by careful management. The owner may not however be able to set off the demand risk inherent in the business case, and may share this risk with the contractor. The owner and contractor may in fact find several areas in which risk sharing is of mutual benefit. Incentive payment arrangements can be based on positive outcomes in such cases, and would serve to align the objectives and interests of both parties.

Risk Event and Allocation Matrix - Water Supply Design, Build and Lease Project
(O = Owner, C = Contractor, I = Insurer)

Investment stage/risk event	Category/Risk allocation				
	Political	Economic	Commercial	Project	Financial
Design:					
Faulty demand estimate				O/C	
Inadequate site investigation				O/C	
Inadequate design standards				O	
Existing assets condition poor				O	
Negligence				C	
Regulatory changes	O				
Asset creation:					
Capital costs underestimated				O/C	
Finance charges increase				O	
Counterpart capital not available				O	
Land acquisition delays	O			O	
Construction delays				C	
Cost overruns		O		C	
Insolvency of contractor				O	
Third party damages				I	
Functional underperformance				C	
Structural failure				C	
Operation:					
Unforeseen operating costs	O	O	C		
Raw water shortages			O		
Major repairs			O		
Third party claims			C/I		
Accidental damage			C/I		
Operating volumes higher/less than expected			O/C		
Unit revenues lower than expected			C		
Unforeseen competition		O			
Revenue collection costs higher			C		
Loss of revenue due to closures			C/I		
Revenue less than debt service					O/C
Loss due to fraud			C		
Lifetime below expectations					O

Note: Shared allocations (distributed according to contract provisions) should reflect relative influence of parties on risk magnitude or cost of minimization.

Further Reading:

World Bank 1996 Financing Private Infrastructure, Lessons of Development #4, IFC, Washington D.C.

Institution of Civil Engineers and Institute of Actuaries 2002 RAMP - Risk Analysis and Management for Projects Thomas Telford, London

Procurement Planning for Private Participation in Town Water Supply and Sanitation

Annex 3 - Typical Special Conditions of Contract

The following clauses are drawn from a Sample Bidding Document prepared for the Vietnam District Town Water Supply Pilot Project. The sample is based on the World Bank SBD for Smaller Works adapted to suit a single point responsibility contract including a leasing agreement for a new system. The following clauses comprise the Special Conditions of Contract required to incorporate the lease arrangements and the operations service requirements into the bidding and contract documents. The clauses are new clauses in many cases but in some instances are amendments to the General Conditions of Contract (GCC) clauses, particularly in the case of Definitions. The clauses are an illustration of the adaptation necessary; square brackets [...] indicate information to be added in the specific contract. Specific Documents to be used in other situations should be drafted in context.

S1. Definitions (GCC Clause 1)

S1.1 Terms that are defined in the General Conditions of Contract may also be further defined in these Special Conditions of Contract and in such case the meanings indicated in the Special Conditions of Contract shall apply. Boldface type is used to identify defined terms.

Advance Payment means the Payments indicated in the Bidding Data (ITB 33.1) including but not limited to the Construction Advance and the Operations Advance.

Commissioning means operation of the Facilities or any part thereof by the Contractor following completion of construction, installation and pre-commissioning, which operation is to be carried out by the Contractor as provided in SCC subclause S7.2 hereof, for the purpose of carrying out Guarantee Tests.

Completion Date means the intended Final Completion Date at the conclusion of the Operational Phase as indicated in the Contract Data.

The **Contract** is the Contract between the Employer and Contractor to execute, complete, maintain and operate the Works. It consists of the documents listed in GCC Clause 2.3.

The **Contract Price** is the price stated in the Agreement for the design, construction and commissioning of the Facilities and thereafter as adjusted in accordance with the provisions of the Contract.

The **Construction Documents** are the drawings, design reports and computations, computer software, samples, patterns, models, operation and maintenance manuals, as-built drawings and other information pertinent to the temporary and permanent construction of the Facilities to be submitted by the Contractor.

Construction Phase means the period from the Start Date to the intended Interim Completion Date.

Customer means any party who has entered into a valid Customer Service Agreement with the Contractor.

Customer Service Agreement means the form of Agreement between the Contractor and Customer as appended hereto.

District Town means an urban settlement designated as the seat of a District-level administrative jurisdiction of GOV whose administrative area comprises the area for execution of the Operational Services to be provided by the Contractor.

Design Services means all those services ancillary to the preparation and submission of Construction Documents by the Contractor including but not limited to data surveys and collection, data analysis, engineering designs, computations and drawings relating to preliminary and final designs for the Facilities to be constructed by the Contractor.

The **Donor** means the Official Development Agency named in the Contract Data.

The **Expiration Date** means the [tenth] anniversary of the Interim Completion Date and marks the expiration of the Operational Phase.

Facilities means the water supply system(s) to be constructed, including but not limited to Plant supplied and installed, and all the Design Services and Installation Services related thereto, by the Contractor under the Contract. The Facilities completed in accordance with the Contract would be owned by the Employer.

Final Completion Date means the intended completion date of the Operational Phase and shall be the date of the Completion Certificate.

GCC means Conditions of Contract Part 1 General Conditions of Contract

Guarantee Tests means the tests specified in the Specifications to be carried out to ascertain that the Facilities or a specified part thereof is able to attain the Functional Guarantees specified in the Specifications in accordance with the provisions of SCC subclause 7.2 hereof.

Installation Services means all those services ancillary to the supply of the Plant and materials to be provided by the Contractor under the Contract; including but not limited to procurement, transportation and provision of marine or other similar insurance, inspection, site preparation works, installation, testing, commissioning, operations, maintenance, and staff training.

Interim Completion Date means the intended completion date of the Construction Phase as indicated in the Contract Data and shall be the date of issue of the Operational Acceptance Certificate.

Lease Fee means the fee stated in the Agreement to be paid monthly to the Employer by the Contractor for the duration of the Operational Phase commencing following the intended Interim Completion Date in accordance with the Lease Fee Schedule.

Maintenance Defect is any part of the Works not maintained in accordance with the Contract.

Operational Acceptance means the acceptance by the Project Manager of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor's fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of SCC Clause 7.2 hereof.

Operational Phase means the period from the intended Interim Completion Date to the Expiry Date. During the Operational Phase drinking water in accordance with the

Specifications shall be supplied continuously and reliably to all Customers in good standing and for such public purposes as defined in the Contract Data.

Operations Services means all services ancillary to the continuous provision of drinking water required during the Operational Phase of the Contract including but not limited to management; marketing; customer services (including connection and disconnection, metering, billing and collection of charges); accounting and auditing; inventory control, record keeping and reporting; security, repair and routine and periodic maintenance of Facilities; and all personnel, plant, vehicles, premises (including offices, stores, workshops and garages), office equipment, workshop tools and equipment, and consumable materials related thereto.

Performance Standards are the minimum performance standards for the quality of the Operational Services defined in the Specifications which the Contractor shall comply with.

Rate Adjustment Index shall be the Price Adjustment Index referred to in GCC Clause 46 and stipulated in the Contract Data.

SCC means Conditions of Contract Part 2. Special Conditions of Contract

Service Area means the area referred to in the Bidding Documents for the delivery of the Operational Services by the Contractor in accordance with the Contract.

Service Connection means the pipe and fittings, flow metering device and isolating valves installed from the distribution main to a point about one meter inside the customer's site boundary. All potential Customers within the service area of the Facilities shall be entitled to receive a Service Connection in accordance with the Customer Service Agreement.

Tariff means the rate stated in the Agreement at which water services are charged to the Customer in any given month of the duration of the Operational Phase, which rate is subject to quarterly adjustments in accordance with the Contract

The **Works** as defined in GCC 1.1 are hereby further defined as what the Contract requires the Contractor to (a) design, construct, install, and maintain during the Construction Phase (hereinafter the Facilities); (b) operate and maintain during the Operational Phase (the Operations Services); and (c) handover to the Employer on the Completion Date, as defined in the Contract Data

S2. General (GCC Part A)

S2.1 The insurance cover to be provided in accordance with GCC Clause 13.1 shall be in force from the Start date to the end of the Final Completion Date.

S2.2 The Contractor shall submit detailed design drawings showing the proposed permanent Works to the Project Manager who is to furnish within thirty (30) days of the submission thereof written approval if they comply with the Contract. The Project Manager will assist the Contractor to obtain documentary approval of third parties to the design of the permanent works and of temporary works provided in accordance with GCC Clause 18.1, where required. The Project Manager's approval shall not alter the Contractor's responsibility for the design of the Works.

S2.3 The Employer shall be responsible for acquiring and providing legal possession of the Site and access thereto to the Contractor (GCC Clause 21.1), and such other permits and approvals as listed in the Contract Data. While the Contractor is in possession of the Site, and

if requested by the Contractor, the Employer shall use its best endeavors to assist the Contractor in obtaining in a timely manner all data, permits, approvals and licenses necessary for the execution of the Contract that the Contractor is required to obtain from all local, provincial or national government authorities.

S2.4 The Contractor shall have the exclusive right, for the duration of the Operational Phase, including any renewal or extension thereof, to access the Facilities for the purposes of managing, operating and maintaining the Facilities, to provide potable water services through the Facilities to Customers in the Service Area and to provide the other Services in the Service Area, in accordance with the terms of the Contract.

S2.5 The Employer and the Peoples Committee concerned will prohibit the drilling and construction of wells for commercial and domestic drinking water supply purposes in the Service Area.

S3 Quality Control (GCC Part C)

S3.1 The Contractor shall carry out the Operational Services in accordance with the performance standards specified in the Specifications, and shall ensure that at all times that water supplied to Customers is wholesome and conforms to current Vietnamese drinking water quality standards. The Contractor shall ensure that [adequate] water pressure is maintained and that water supplies are available continuously, except under the following circumstances:

- (a) the Contractor may temporarily interrupt supplies to examine, alter or repair the Facilities and has advised Customers likely to be affected in advance of the date upon which and time between which supplies will be interrupted; and
- (b) whenever an interruption to supply occurs due to action or failure of a third party or due to Force Majure.

S3.2 The Contractor shall supply water to any Customer who applies for a service connection and is located in the Service Area, in accordance with a Customer Service Agreement (hereinafter CSA) acceptable to the Project Manager. Water shall be supplied within thirty (30) days after the receipt of the signed CSA for connections not requiring an extension or reinforcement of the Facilities and not later than 90 days for connections requiring extensions of the Facilities for a distance not exceeding 50 meters. The Contractor shall not be required to provide connections to customers located outside the Service Area or requiring extensions to the Facilities exceeding 50 meters.

S3.3 The Contractor shall reconnect Customers who have been disconnected but have paid any charges outstanding and any reconnection charges due. Water shall be supplied within two working days after full payment has been received by the Contractor.

S3.4 The Contractor may provide and install at its own expense, extensions and reinforcements to the Facilities as approved by the Project Manager. On completion of the extensions and reinforcements and following acceptance by the Project Manager, the said extensions and reinforcements shall be deemed to be a part of the Facilities for the purposes of this Contract.

S3.5 At all times the Contractor shall provide a high quality of service to Customers, in accordance with but not limited to the following service standards:

- (a) reading customer meters and billing customers monthly.
- (b) responding within two working days to customer enquiries and complaints, and taking action as necessary within seven working days;
- (c) giving notice to Customers at least 48 hours in advance of any planned interruption in service;

- (d) making alternative water supplies available for planned interruptions in service to schools, hospitals and key public buildings, and to all customers for interruptions in service exceeding 24 hours.
- (e) effecting urgent restoration of services for any unplanned interruptions in service and informing Customers on progress in making repairs and treatment of any potentially contaminated supplies;
- (f) providing billings to Customers which clearly indicate services provided, meter readings, charges and taxes included, period covered, forms and places of payment, deadline for payment and penalties for late or non-payment;
- (g) maintaining a customer service office open to Customers during normal office hours; and
- (h) providing publicly available contact information (address, phone number) for contact persons who can be contacted by Customers out of normal office hours to receive reports of service interruption, emergencies and complaints.

S3.6 The Employer shall ensure that the Contractor shall have free access to Customer installations for service connection installation, meter reading, verification and other tasks reasonable associated with the Operational Services provided by the Contractor.

S3.7 The Contractor shall not refuse any reasonable request from the Employer or Peoples Committee concerned in connection with watershed protection to ensure the sustainability of the water source. The Employer will use its best efforts to ensure that the watershed concerned is protected from acts prejudicial to the sustainability of the water source by others.

S3.8 The Contractor shall maintain adequate technical, administrative and financial records as follows, and make them available for inspection by the Project Manager from time to time:

- (a) a complete set of up-to-date as built drawings of the Facilities and a corresponding complete register of physical capital assets comprising the Facilities, including fully and partly depreciated items, disposals and replacements as may occur from time to time; and
 - (b) administrative records including the following:
 - (i) water abstraction, treatment, supplied and consumed by calendar month
 - (ii) capital works and renewals carried out by the Contractor by calendar year
 - (iii) routine and periodic maintenance carried out by the Contractor by calendar year
 - (iv) customers, consumption and billing by calendar month
 - (v) customer payment defaults, disconnections and reconnections by calendar month
 - (vi) customer complaints and actions taken by calendar month
 - (vi) financial transaction ledgers and financial statements in accordance with generally accepted accounting principles; and
 - (vii) cost accounts relating to major functional areas of the operational services.

S3.9 The Contractor shall routinely provide performance reports to the Project Manager at monthly intervals including the following information in respect of the preceding month:

- (a) Water availability in terms of hours of uninterrupted supply
- (a) Water pressure range in terms of maximum and minimum pressure achieved daily
- (b) Water quality in terms of the indicators specified in the Specifications
- (c) Facilities maintenance, repair and replacement activity.
- (d) Service coverage in terms of the number of active service connections compared to the number of households and business premises in the Service Area
- (e) Total number of service connections, and net increase/decrease from previous report period, including new connections, disconnections and reconnections
- (f) Number of complaints received and action taken.

- (g) Amount of unaccounted-for-water in terms of water produced compared to water sold.
- (h) Current Tariff applied to billings, and
- (i) Number and total amount of Customer accounts past due in excess of 30 days and 60 days

S3.10 The Contractor shall provide to the Project Manager annually in respect of the previous fiscal year an opinion by an auditor acceptable to the Project Manager on the financial statements and books of the Contractor.

S3.11 The Contractor shall permit the Donor to inspect the Contractor's accounts and records relating to the performance of the Contract and to have them audited by auditors appointed by the Donor if so required by the Donor.

S3.12 The Contractor shall provide for the Project Manager's approval prior to the Interim Completion Date a maintenance management plan in respect of the Facilities, including a program of routine, periodic and preventative maintenance activities to be carried out during the Operations Phase of the Works consistent with the recommendations of the respective equipment manufacturers and in accordance with the Specifications. The Contractor shall provide to the Project Manager prior to the expiration of the second, fifth, and eighth year of the Operational Phase, an asset condition disclosure classifying on a graded scale the condition of the capital assets of the Facilities including specific information on the water source works, treatment plants, transmission pipelines, distribution networks, service reservoirs, and buildings, and on other fixed and movable assets relevant to the operation and maintenance of the Facilities.

S3.13 The Project Manager shall from time to time and at least annually during the length of Operations Phase of the Works check the Contractor's maintenance work and shall notify the Contractor of any Maintenance Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Project Manager shall within fourteen days of the inspection give written notice to the Contractor of any Maintenance Defects. The Contractor shall correct the notified Maintenance Defect within the length of time specified by the Project Manager's notice. The Contractor is liable for the correction of Maintenance Defects at the Contractor's own expense for the full duration of the Operations Phase of the Works.

S4. Cost Control (GCC Part D)

S4.1 The Contractor shall be paid a Lump Sum for the value of the quantity of design and construction work done in accordance with the Contract. Payment statements valuations shall be in accordance with GCC Clause 42 and the payment schedule stated in the Bill of Quantities, Appendix.

S4.2 The Contractor shall pay all costs and expenses associated with the work required for the required Operational Services including but not limited to personnel, raw water, electricity, inventory and consumables, new service connections, routine repair and maintenance, insurance and applicable taxes. Major repairs and renewals to the Facilities caused by fair wear and tear that affect the quality of the work or prevent the work being completed before the Final Completion Date shall be Compensation Events. If such repairs and renewals cause additional cost to the Contractor before the Final Completion Date, the Contractor shall be compensated in accordance with GCC Clauses 44.2 and 44.3 herein.

S4.3 The Contractor may charge the Customer the following fees and shall be entitled to retain all fees:

- (a) A charge for the provision of a Service Connection to Customers not listed in Volume 3 of the Contract, and a charge for any reconnection;

- (b) A fee for the provision of drinking water supplies to Customers in accordance with the provisions of the Contract, equal to the Tariff as adjusted from time to time pursuant to SCC Clause S4.5 herein. [The Contractor may charge a minimum of [five (5)] cubic meters of water consumption per connection per month.]
- (c) A fee for such public uses of water as the Employer may reasonably request with the exception of fire fighting.

S4.4 The Contractor shall provide free of charge an adequate supply of water for fire fighting purposes.

S4.5 The Tariff as of the Interim Completion Date shall be equal to the Tariff stated in the Agreement. Commencing on the second anniversary of the Operational Acceptance Date and annually thereafter, the Tariff shall be adjusted (each such adjustment, a “TA”) in accordance with the formula prescribed in GCC clause 46 herein except that “P” shall be the adjustment factor for the Tariff; “A” and “B” represent the non-adjustable and adjustable portions, respectively of the Tariff; and that “Im” shall be the index prevailing on the last day of the calendar year following the previous adjustment. The Contractor shall submit an application to the Project Manager for a TA within thirty (30) days following the last day of the calendar year and the Project Manager shall inform the Contractor of the Employer’s approval within thirty days of receipt of the submission. The TA shall be made effective on the first day of the next following calendar year.

S4.6 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the Works, increase or decrease the Contract Price or Tariff, or delay the execution of the Works. In cases other than Compensation Events, the Project Manager may require the Contractor to provide an estimate of the expected effect in accordance with GCC Clause 32.1 and the Contractor shall cooperate with the Project Manager in accordance with GCC Clause 32.2.

S4.7 Pursuant to Clause S4.6 herein, at any date after the second anniversary of the Operational Acceptance Date, the Contractor and the Employer may agree to a special adjustment of the Tariff (a “STA”) when the average sustained daily volume of water supplied by the Contractor is more than twenty (20) percent or less than eighty (80) percent of the average daily volume estimated in the Feasibility Study (Volume 4 of this contract) for the corresponding date. A special tariff adjustment for this purpose shall be made no more than once during the contract duration.

S4.8 The Contractor shall pay the Employer the following fees:

- (a) a Lease Fee following the Lease Fee schedule attached to the Agreement and as amended pursuant to SCC Clause S4.6 and S4.7 herein; and
- (b) a monthly Supervision Fee equal to the amount stated in the Contract Data.

S4.9 In the event that any amount due to the Employer by the Contractor is not paid then interest shall accrue on such amount at a rate equal to the [annual discount rate] published by the State Bank of Vietnam, as of the day the amount becomes due and payable, for each day such amount remains unpaid.

S4.10 The Contractor, in its own discretion, may cut off service to Customers for late or non-payment under the following circumstances:

- (a) when a customer's account is 45 days past due, a written notice shall be provided to the Customer informing the Customer of the cut off date if the debt is not paid within ten (10) days of receipt of the notification; and
- (b) if the debt has not been paid to the Contractor prior to the cut off date referred to herein, or

- (c) if a disconnected Customer or person who has no Customer Service Agreement with the Contractor has established an unauthorized connection to the connection of another Customer then the connected Customer service shall be cut off if after receiving due notice to remove the unauthorized connection the Customer has not done so within five working days.

S5. Penalties and Bonus (GCC 48 & 49)

S5.1 For the purposes of GCC Clauses 48.1 and 48.2 the Intended Completion Date shall mean the Interim Completion Date as defined herein.

S5.2 GCC Clause 49.1 shall not be applicable to this Contract.

S5.3 Failure by the Contractor for more than sixty (60) days, or 15 days in the case where failure could adversely affect public health, to carry out any part of the Operational Services or meet one or more Performance Standards, after written notice by the Project Manager, shall constitute a basis for the Project Manager to assess financial penalties against the Contractor. The amount of penalty shall be equal to [...] percent of the costs that, in the reasonable opinion of the Project Manager, the Contractor would incur in order to carry out such service or meet the Performance Standards concerned, provided that if the Contractor does not correct the failure within one hundred and eighty (180) days of the notice, the amount of penalty shall be equal to [...] percent of such costs. The Contractor shall pay any penalties assessed in accordance with the foregoing to the Employer within thirty (30) days after receipt of a demand therefore, provided that, in the event that the Contractor fails to make a timely payment of such assessment the Project Manager may draw such unpaid amount from the Performance Security.

S6. Securities (GCC 51).

S6.1 A Performance Security shall be provided in accordance with GCC 51.1 and shall be valid until the issue of the Final Completion Certificate. The minimum amount of the Performance Security for the periods stated in the Contract Data shall be as stated in the Contract Data. Failure of the Contractor to maintain in force an acceptable Performance Security shall constitute sufficient grounds for termination of the Contract.

S7. Acceptance, Completion and Reversion (GCC 54 & 55)

S7.1 The Completion of the Works shall be accomplished in two consecutive phases, specifically the Construction Phase which shall not exceed the duration stated in the Contract Data and shall be deemed complete upon the date of issue of all Operational Acceptance Certificates by the Project Manager (hereinafter the Interim Completion Date), and the Operational Phase which shall not exceed the duration stated in the Contract Data and shall be deemed complete upon the date issue of the Completion Certificate (hereinafter the Final Completion Date).

S7.2 The Contractor shall commission the Facilities or parts of the Facilities as agreed with the Project Manager following completion of construction and installation. The Contractor shall provide all personnel and materials and other matters required for Commissioning. The Guarantee Test shall be conducted by the Contractor in the presence of the Project Manager during Commissioning to ascertain whether the Facilities or the relevant part thereof can attain the Functional Guarantees specified in the Specifications. The Contractor shall request the Project Manager to issue an Operational Acceptance Certificate in respect of the Facilities or any part thereof when the Guarantee Test has been successfully completed [or when the required Liquidated Damages have been paid if the Guarantee Test has not been successfully

completed]. The Project Manager shall, after consultation with the Employer, and within seven days of receipt of the Contractor's request, issue an Operational Acceptance Certificate.

S7.3 The Contractor shall maintain the Facilities in good repair and working order and shall provide Service Connections to new Customers on request for the duration of the Operational Phase in accordance with the Contract. Upon expiration or termination of the duration of the Operational Phase, the Facilities and all of the rights, duties and powers of the Contractor provided under the terms of this Contract shall automatically revert to the Employer or to the Employer's successors or assigns, and the Contractor shall quit and surrender possession of the Facilities to the Employer in accordance with a hand over plan to be submitted for the Project Manager's approval six months prior to the Expiration Date. The Contractor shall bear all liabilities and shall be entitled to receive and retain all revenues arising from its activities during the Operational Phase. On the Expiration Date, the Contractor shall retain all cash and marketable securities related to the Facilities and transfer to the Employer or to its successors or assigns:

- (a) all other property related to the Facilities or the provision of Operational Services;
- (b) inventory and consumables sufficient to operate and maintain the facilities for ninety (90) days after the Expiration Date; and
- (c) the records associated with provision of the Operational Services and a well-functioning computerized billing system and customer accounts data base but not including the hardware.

On completion of the transfer the Contractor shall apply to the Project Manager for a Final Completion Certificate. The Project Manager shall in consultation with the Employer, issue a Final Completion Certificate within seven (7) days of receipt of the Contractor's request.

Procurement Planning for Private Participation in Town Water Supply and Sanitation

Annex 4 - Procurement Strategy –Private Finance Options¹

Introduction

A4.1 A Private Provision of Infrastructure (PPI) scheme occurs when the government grants a concession to a private firm in order to finance and build or modernize a facility that will also be operated by the firm for a certain period of time. Under a concession arrangement, a private contractor is responsible for the provision of a service, its operation and maintenance, and for building and financing any new investments. At the end of the concession term, the sector assets are returned to the state or owner².

A4.2 In concession arrangements a donor may provide the Borrower with funding for technical assistance (in the form of financing advisors), investment funds or guarantees. In the case of large projects, investment funds may be provided by the World Bank, for example, through the International Finance Corporation (IFC), while guarantees may be provided through the Multilateral Investment Guarantee Agency (MIGA). In the case of small projects funds may also be provided through the domestic financial sector by IDA or IBRD, which can also provide guarantees. Where the Bank is involved in financing the cost of a project procured under at BOO/BOT/BOOT or other PPI arrangement, the entrepreneur should be selected under ICB or LIB procedures acceptable to the Bank as described below. In such a case, the entrepreneur may use their own procedures in purchasing goods, works, or services (from eligible sources – see Guidelines para. 3.13). Where the entrepreneur is not selected as described above (for example, through an unsolicited offer), the goods, works, or services financed by the Bank should be procured by means of ICB or LIB.

Preparation for Bidding

A4.3 To maximize competitive interest from well-qualified bidders, the owner should adopt a strategy aimed at minimizing the costs to bidders of preparing their proposals and restricting the number of bidders in the final tender round to no more than three or four. Suitable consultants should be selected to assist the owner in the following steps before the tendering process begins:

- establish a dedicated project team made up of experienced individuals in the areas of procurement, engineering, financing, market analysis, revenue forecasting, and legal matters;
- begin the process of putting in place an appropriate legal and regulatory framework for the operation of private concessions;
- establish a clear definition of what is required from the private sector;
- launch an expert review of the financial viability of the project finance;
- decide on how any financing gap revealed will be handled; and
- develop a firm plan for the bidding process, including the timetable, number of stages, and the objectives to be achieved at each stage, together with a clear set of requirements and specifications.

A4.4 Consultants and advisors will basically provide technical assistance to advise the government on the most appropriate way to carry out procurement and on the economic, regulatory, legal, financial and technical issues that will arise with the granting of the

¹ This Annex draws extensively on the World Bank's 'Bank-financed Procurement Manual, Section 26 - Procurement of Privately Provided Infrastructure' (in draft, dated July 2001)

² Slightly different is a BOOT scheme under which the private operator also retains ownership of the facility during the concession period in order to guarantee bank loans.

concession. Due to the complex nature of concessions, the owner and selected advisors should make presentations to prospective bidders on the proposed concession. Conferences may also be held to give potential bidders information on the prequalification and bidding processes.

Prequalification

A4.5 Prequalification should be used to reduce to about three or four the number of interested bidders selected for the main bidding process. Bidders should thus be provided with sufficient information on the concession to enable them to undertake an adequately detailed assessment that will allow them to justify the commitment of substantial resources to making a comprehensive and competitive submission. The Borrower should allow joint ventures to enable qualified small operators to join large contractors or banks to compete with traditional concessionaires, and in this way foster competition.

A4.6 Apart from information on the design, scope, timetable and background on the project, the Borrower should provide the following information in prequalification documents:

- Summary demand forecasts, with estimates of revenue and demand elasticity;
- Progress on various critical path actions relevant to the project;
- Scope of the proposed concession, including an outline of the concession agreement covering the key issues; and
- An outline of bid selection and evaluation criteria to be used.

A4.7 Prequalification should assess the capabilities of bidders in the areas of design, financing, construction and operation of similar facilities. Bidders should provide the following information:

- A description of their experience in the design, construction and operation of the type of project being considered;
- A description of the bidder's: (i) proposed commercial structure, if awarded the concession and their understanding of commercial issues; (ii) likely sources of financing; (iii) proposed scale of financial commitment and, if relevant, the level of the financial commitments of consortium members; (iv) likely level of financial returns sought;
- Their approach towards managing construction contracts;
- Their experience in competitive tendering for projects involving a design, construct and operate concession;
- The agreement and organization among partners in case of a joint venture;
- Their experience in major construction and operational undertakings in the host country;
- Their economic and financial history; and
- History of litigation or arbitration.

A4.8 In evaluating prequalification applications, relative weights may be allotted to the various criteria listed above and, given the nature of these criteria, careful judgments will often be called for in assessing bidders' capabilities in a number of these areas rather than there being any strict qualitative criteria.

A4.9 The Borrower should indicate the minimum acceptable capital, current ratio and debt ratio that bidders should have. The financial capabilities of sponsors should be assessed by the Borrower taking into consideration the following issues:

- the combined net worth of the sponsors should at a minimum exceed the sum of the level of equity plus the quantified value of any guarantee-like undertakings, by a margin that is comfortable enough for them to undertake their original business commitments;
- the source and application of the bidder's funds;
- the bidder's short-term and long-term debt schedule;
- the bidder's income statements; and

- the realism of the Borrower’s expected return and how well the bidder demonstrates an understanding of the key commercial and financing issues that will arise from the concession.

The Bidding Process

A4.10 Whether an owner uses a single or two-stage bidding process depends on how precisely the technical requirements can be defined³. In cases where the project is defined through technical and performance specifications a single-stage bidding process is appropriate. However, where the concession project is complex and both technical and performance requirements are not clear, the government can undertake a two-stage bidding process and obtain a general idea of bidders’ qualifications and ideas on the concession (see Annex 2). On this basis, the government can modify bid documents in accordance with the needs of the project.

A4.11 In a two-stage process, the Owner prepares a first-stage bidding document with functional performance specifications, rather than detailed technical specifications. In response, bidders offer unpriced technical proposals (i.e., no financial proposal is submitted at this time). The Owner then assesses the suppliers’ qualifications, evaluates the technical proposals, and indicates to the suppliers precisely what must be done to make their bid technically responsive.

A4.12 Following the first-stage evaluation, the Owner prepares the memoranda of changes for each bidder and may prepare addenda to the bidding documents, including revisions to the technical requirements made in the light of the first-stage technical evaluation, and initiates the second-stage bidding process. During the second-stage bidding process, bidders offer amended bids containing their final technical proposal and a financial proposal. The Owner then evaluates the combined proposals (technical and financial) according to the method specified in the bidding documents.

A4.13 Depending on the complexity of the project and given the level of detail required to maximize the bid value, bidders should be given a minimum bid period of three to four months to prepare their bids. During this period the Owner should promptly answer bidders’ questions and comments, on a consistent and open basis. New information or amendments to the documents should be provided to all bidders.

Bidding Documents

A4.14 Bidding documents should clearly state the Owner’s contractual, financial and technical requirements and the bidding process to be used, and should include:

- a detailed definition and description of the project;
- a draft concession that will include a schedule containing: (i) a technical performance specification, relating to both construction and operations; and (ii) drafts of any other key agreements to which the owner will be a party, such as any direct agreements between the owner and the Bank and other potential lenders, that give the lenders the right to take over the concession in the event of default by the concessionaire. This will help reduce the post-bid negotiation period, as the owner’s position on all aspects of the concession will be clear. These documents should be balanced and realistic and should reflect an initial negotiation position;
- Full details of the government’s proposed support for the project;

³ The advantages of a two-stage process include the ability of the owner, during the first stage, to interact more extensively on technical matters with bidders than is permissible in a one-stage process. In this way, an owner can learn from the market and adapt its requirements. In addition, a two-stage process allows an owner to, in the first stage, state its requirements in more general functional terms than the detailed functional and technical requirements necessary to carry out a one-stage process. By knowing the bidders and their technologies prior to the second stage, this reduces the burden of preparing detailed functional and technical requirements, which are so comprehensive that they can accommodate the entire universe of potential technical proposals.

- Details of any external support agreed for the project.

A4.15 Bidding instructions and information should notify bidders precisely what they need to do to submit a compliant tender and what will happen to the bids once they are submitted. The instructions should set out:

- The timetable that bidders must adhere to for bid submission;
- The required form of tender;
- Details of any bonds and guarantees required of bidders;
- Details on what bids should contain; and
- The precise criteria on which both compliant and variant bids will be evaluated.

A4.16 The bidding information should be made up of:

- Detailed, independently validated underlying demand forecasts and revenue projections, with assumptions and methodology used;
- Survey reports including any detailed soil or ground conditions tests that may be relevant or any detailed environmental assessment of the project site or service area;
- Legislation, existing and proposed, that will affect the project, including any applicable environmental regulations or guidelines.

A4.17 Information on the concession should be as complete as possible to avoid the bidders incurring unnecessary time or expense seeking clarification, and to enable them to meet the owner's requirements. Before the owner issues bidding documents it must resolve the following critical issues and reflect the decisions in the contract documents:

- whether the concession period is fixed or whether bidders may propose the duration of the concession;
- where necessary, the basis upon which the concession will revert back to the owner or be transferred to another concessionaire;
- what sort of remedies will be applied for delay in completion of the construction and commencement of operation;
- the degree of allowance for innovative designs or alternative bids by bidders;
- the kind of incentives in the operation of the concession and the mechanism for their application;
- final decisions on risk sharing;
- common information provision, for example, the commissioning of a ground conditions survey by the owner and its inclusion in the project costs;
- final decisions on government support;
- any bonding or guarantee requirements; (careful consideration should be given to the appropriateness of these as their cost will reduce the value of the bid);
- treatment of qualified but variant bids;
- restrictions if any on competing infrastructure;
- agreements on external support (off site infrastructure, etc); and
- potential reimbursement of abortive bidding costs.

A4.18 The Owner should also design performance indicators that will assist in the supervision of the concession. Indicators should include the bidder's proposals for:

- expansion of the service to be provided under the concession which might entail, for example, submitting for approval a plan setting out indices measuring the time for connection of new users to the system, the quality of supply to all users, the number of users who will be served and the barometric pressure of water at consumer entrance of the supply;
- quality of the technical operation of the system – in this case the bidders should submit to the Borrower a plan setting out an indication of intended service continuity detailing a measure of the number of days and hours per year when consumers will go without water and the measure of water not accounted for in the system;
- quality of maintenance of concession facilities;

- attention to customers – this may be measured by indicating the connection time (the number of days between the date a new customer asks for connection and the date the service begins), reconnection time, telephone service indication (whether the concessionaire has an exclusive telephone service for facilitating commercial operations with customers and for complaints about the service), the number of days between bill delivery and due date; and
- the consistent financial soundness of the concessionaire – the concessionaire should submit financial statements to the regulator that define indices for compliance in terms of debt service coverage ratio, self financing ratio, average collection period, operating profit margin and rate of return.

Bid Evaluation

A4.19 In general, bidders should at the minimum include the following documents with their bids for the concession:

- a signed form of the tender in the specified format;
- technical proposals that clearly demonstrate how the bidder intends to meet the government’s specifications;
- a coherent, well developed commercial and organizational plan for operations of the concession company;
- financial projections and analysis demonstrating the viability of the concessionaire’s operations over the life of the concession;
- the assumptions underlying this analysis on all aspects of construction and operation;
- comprehensive, detailed financing proposals together with evidence of support of lending and investing institutions;
- evidence of adequate financial resources from the bidder, other investors and lenders to cope with unforeseen circumstances; and
- any bonds or guarantees required at the bidding stage.

A4.20 Bidders’ proposals are more likely to match the Owner’s critical objectives if the evaluation criteria are precise and transparent. This also enables the Owner to evaluate tenders easily and rapidly. Evaluation criteria could include at least: (a) Value for Money; (b) Technical Aspects; (c) Financial Arrangements. It would be necessary to integrate the different components of the evaluation methodology to reach a conclusion. Judgments may be made between different aspects of bidders’ proposals, implicitly or explicitly (through assigning weights), or by developing quantitative criteria where practical, and using hurdles or yardsticks for criteria. Depending on the project, the approach should consist of:

- quantitative assessment of the value for money using one or more of the methods described above;
- an assessment of the risk that this may not be realized because of problems with the financial, technical, and operational aspects; and
- adjustment of the value-for-money assessment in light of this risk assessment.

A4.21 The assessment of value for money may involve taking into account for each bidder’s proposal, the level of government support where necessary, and the costs and benefits of each proposal. Where government support is required, the kind of support will be defined in the bidding documents. The evaluation in this instance will be based on the amount of support that each bidder requires. In assessing the value for money, the owner will in effect be selecting the bidder who offers the best commercial proposal. For example in concessions where the economic activity to be undertaken results in income to the government, the concession should be awarded to the bidder who offers the highest income to the Owner.

A4.22 Where the concessionaire is required to bear demand risk, the calculation should be based on the Owner’s own demand projections, in order for a consistent basis for comparison to be made between different bidders. The calculation should incorporate the proposed escalation regime as required in the bidding documents. For example for concessions where

there are multiple customers, such as water supply concessions, but where tariffs are regulated, the Borrower should undertake a comparative assessment of bids based on the proposed charges of each bidder on these bases. In this instance the selected bidder should be the one who offers the largest discount on existing tariffs or the lowest new tariff.

A4.23 The following technical aspects of the bids received should be assessed by the Borrower in its evaluation:

- whether the bidder's technical and management proposals are likely to meet the requirements of the performance specification;
- technical and design risks of the proposals;
- the proposed construction costs, their timing and the likelihood of their attainment; and
- the proposed operating and maintenance costs and the likelihood of their attainment.

A4.24 All proposals that meet the required technical standards should be put forward for a financial evaluation, while those that do not should be rejected. Evaluation of technical aspects during the construction and operating period could be simplified by:

- specifying stringent technical standards;
- providing for a penalty point system to be applied for noncompliance; and
- adopting high standards in relation to the bidder's experience.

A4.25 The Owner must assess the credibility of the commercial and financial aspects of the bidders' plans over the concession period⁴. The underlying assumptions in each bid should be reviewed stringently and in detail and the track record of the bidders' financial advisors and supporting financiers should be assessed. The assessment of credibility of a bidder's proposal will involve considering issues such as the bidder's own capital structure, and the sources and availability of funding. In the absence of bidder guarantees, the owner should consider:

- the amount and nature of the subscription of equity;
- the strength and credibility of expressions of financial support from banks and institutions that accompany the bid;
- the requirements of lenders and other project participants such as suppliers and operators, with whom there is an arms-length contract;
- the availability of standby equity and debt;
- in the absence of equity the extent to which the commitment of other participants (in terms of bonds and guarantees and other conditions) provide an adequate substitute for equity;
- the realism of the bidder's revenue projections as compared with the owner's projections;
- the soundness and feasibility of the financing proposals, that is, to the extent to which they are unconventional, are complex or are dependent on external factors; and
- the bidder's proposed timetable for obtaining underwritten commitments.

Contract Negotiations and Execution

A4.26 Once the winning bid has been selected (and the Owner has obtained the Bank's approval on the award of the concession to the selected bidder), the bidder is then informed, and negotiations with the Owner are held in order to ensure that:

- Private sector finance can be underwritten on terms contained in the preferred tender⁵;

⁴ Using an adequately specified financial model, the robustness of the financial structure can be tested by sensitivity analysis to assess the ability of the bidder's projected cash-flow to withstand adverse variations in economic assumptions. The assessment can then be converted into a yes-no judgment or into a weighting sufficient to remove the risk of failure.

⁵ Underwritten offers of debt finance should be required at this stage. This is to ensure that the financial markets are not flooded with competing financial proposals for the same concession, and to ensure that abortive bidding costs are minimized by necessitating the completion of financier's due diligence and imposition of commitment fees only after the preferred bidder has been identified.

- Construction and equipment supply contracts have been negotiated that reflect the terms of the concession agreement, and are executed at the same time;
- The process of obtaining legal powers and ensuring other preconditions are satisfied on time;
- The Owner's timetable of actions and contributions is consistent with the proposed timetable for signing the concession agreement.

A4.27 To prevent unnecessary and capricious negotiations, concession contracts should contain well thought out performance specifications, well balanced incentives and risk-sharing arrangements and strong bonding mechanisms leading the Owner and the concessionaire to adhere to the contract terms. After contract negotiations are complete and before signature, the Owner should submit the final draft concession contract to the Donor for approval. The final contract will take into consideration all of the issues described above, and generally it will set out:

- The definition of the services to be provided by the concessionaire;
- The concession area;
- The rights and obligations of the Owner and concessionaire;
- The regulations to be applied;
- The duration of the contract;
- The tariff regime, adjustment mechanism and process for resetting the tariffs;
- The performance indicators to the quality of the service, and reporting requirements;
- The power of the sector regulator to inspect installations and books;
- The dispute resolution mechanisms and applicable law;
- The process for termination, renewal or rebidding of the concession; and
- The guarantees, warranties and performance bonds;

Contract Administration

A4.28 The contract will specify certain obligations on the part of the contractor that must be monitored and reviewed by the Owner. These are reflected in the performance indicators and routine reports to be submitted by the contractor. The Owner and the contractor would hold quarterly performance review meetings to help ensure compliance and solve problems. The Owner may also make routine reports to the sector regulator including concession performance. The cost of supervision and related activity incremental to the normal business activities of the Owner can be covered by a fee covenanted in the costs of the contractor's operations.

Although the concessionaire has the obligation to raise financing for the concession, the Owner should ensure that the finance promised in the bidding documents is confirmed.

**Town Water Supply
and Sanitation Services
Volume 3**

Water User Associations

Companion Paper B1

**Jo Smet
IRC International Water and Sanitation Centre
March 2003**

Table B1.1: Key stakeholder roles and responsibilities in the WSC, Morogoro Region, Tanzania

Stakeholder	roles	responsibilities
Users	<ul style="list-style-type: none"> ▪ users of water service ▪ active participator in WSC 	<ul style="list-style-type: none"> ▪ pay for water used ▪ report on problems with quality of water service ▪ elect Water User Group Committee
Water User Group Committee	<ul style="list-style-type: none"> ▪ manage public standpost services and arrange for O&M of the system at this level 	<ul style="list-style-type: none"> ▪ arrange operations at standpost level ▪ arrange maintenance activities at standpost level ▪ collect water charges from users and pass these on to the revenue office ▪ elect a representative (WSC Member) to the WSC
Members of WSC	<ul style="list-style-type: none"> ▪ constitutionally the actual owners of the WSC ▪ represent the Water User Groups in the (quarterly) General Meetings and AGM of the WSC ▪ communication link between Board (and management) and Water User Groups 	<ul style="list-style-type: none"> ▪ use control function in strategic decision-making in quarterly General Meetings ▪ fire and (re-)elect Board members ▪ report service successes and problems/complaints from Water User Groups to General meetings ▪ report timely and adequately back issues discussed in General meetings
Board of Directors	<ul style="list-style-type: none"> ▪ govern the WSC 	<ul style="list-style-type: none"> ▪ use control function in strategic decision-making in monthly Board meetings ▪ monitor and evaluate the functioning of the Executive Board and performance of the WSC ▪ elect the three Executive Directors ▪ attend monthly Board meetings
Executive Directors (Chairperson, Secretary, Treasurer)	<ul style="list-style-type: none"> ▪ govern the WSC 	<ul style="list-style-type: none"> ▪ make relevant policies for the functioning of the WSC ▪ recruit the professional management team ▪ monitor the functioning of the professional management team ▪ monitor the technical and financial performance of the WSC ▪ develop annual Business Plans ▪ prepare proposals for technical and financial adjustments or actions ▪ organize monthly meetings for Directors ▪ organize quarterly General Meetings and AGM for Members ▪ communicate to users via Members
Management Team (manager, administrative and technical staff)	<ul style="list-style-type: none"> ▪ manage the WSC in organizational, technical and financial respect 	<ul style="list-style-type: none"> ▪ keep proper accounts on revenues and expenditures ▪ carry out operations and maintenance tasks ▪ make technical and financial reports on the performance of the WSC (monthly, quarterly and annually) ▪ draft proposals and annual Business Plans
Federation of WSCs	<ul style="list-style-type: none"> ▪ protect the interests of the member WSCs ▪ support and advice the WSC in their policy, strategies, operations etc. 	<ul style="list-style-type: none"> ▪ facilitate contacts, negotiations and contracts between private sector and WSCs ▪ discuss WSC interests with national/local government and regulator ▪ provide capacity building and training etc.
Local politicians and leaders	<ul style="list-style-type: none"> ▪ enable and support the WSC to provide a quality water service against an affordable tariff for all 	<ul style="list-style-type: none"> ▪ support the autonomy, transparency and accountability of the WSC ▪ make sure that all groups in society are equitably being served by the WSC ▪ promote the productive use of water for socio-economic development of the area
Local Government staff	<ul style="list-style-type: none"> ▪ enable and support the WSC to provide a quality water service against an affordable tariff for all 	<ul style="list-style-type: none"> ▪ support the WSC through advice to Board and management ▪ act as temporary regulator (monitoring)
National Government staff	<ul style="list-style-type: none"> ▪ establish a regulatory framework 	

The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and should not be attributed in any manner to the World Bank, to its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent.

Companion Paper B1: Water User Associations

Jo Smet

IRC International Water and Sanitation Centre

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Abbreviations

AGM	Annual General Meeting
CBM	Community-Based Management
FEWASCO	Federation of Water Supply Companies (in Morogoro Region, Tanzania)
GCS-AEP	Groupement de Conseils et de Suivi des Adductions d'Eau Potable (Advice and Monitoring Unit for Piped Drinking Water Service)
O&M	Operation and Maintenance
PSP	Private Sector Participation
WSC	Water Supply Company
WUA	Water User Association
WSDB	Water and Sanitation Development Board

1. Introduction

1. This paper gives an overview of the Water User Association (WUA) management model, with specific reference to a Water Supply Company (WSC) case study from Morogoro region in Tanzania (Kanshahu et al, 2002) (DHV, 2001). Reference is also made to experience from other WUAs, drawn mainly from Africa and Latin America.

2. The WUA model is perhaps the most viable approach for smaller towns with a population ranging from 2,000-25,000, which have typical rural characteristics, limited local government capacity, and weakly developed economic and institutional environments. The WUA is primarily based on local human resource capacity (the manager and operating staff are hired locally, while management oversight is voluntary) and carries low overheads. Although the WUA model has potential, when left in isolation it is likely to fail. It needs support from higher level organizations which provide guidance, training and access to specialist skills and knowledge.

3. The WSC model from Tanzania (See Table B1.1 opposite) is interesting in that it represents a transition between the rural, community-based management model typical of WUAs, and more formal "Water Boards" in larger towns, which have autonomous legal status and a delegated management structure. The WSCs described here have a formal management structure, and hire professional staff (including a manager). The WSC case study also links the model to higher-level support (in this case a Federation of WSCs).

4. The potential scope of community-based approaches is enormous. In Asia and Africa, for example, about 68% of the people live in rural areas; and in Latin America

it is about 25%¹. It is estimated that of the remaining urban population, about half live in small and medium-sized towns of less than 50,000 people (although there may be significant regional variations). For these settlements, community-based management (CBM) organized by some form of WUA has become a common approach. There are some shortcomings to the model, especially in towns: governments do not always create the necessary enabling environment, including the legal basis of the WUA and the support mechanisms needed to sustain community-based service provision. As village settlements grow and take on the characteristics of small towns, with increased commercial activity, these deficiencies put long-term sustainability and effectiveness at risk.

5. Technology-wise, water supply systems in these settlements have limited source works and treatment, and vary from water points (standposts) to piped water systems with storage but only minimal distribution, to a limited number of single or multiple-tap house-connections. There may also be a well developed market through independent vendors/providers. It is fair to say that the WUA model is more suitable for smaller and less technically complex water supply systems, but, as with management structures, this may be transitional.

6. The model can also have advantages over more formally structured models in larger towns. The WUA is essentially a cooperative and the concept empowers users. They have control over decision-making in planning, implementation, operation, maintenance, management, and financial arrangements (IRC, 2001). The WUA is a democratic institution allowing direct social pressure to influence management decision making, and as such it supports a process of democratic social development. Where private sector participation (PSP) or municipal management has failed to provide expected services and users have lost confidence, WUAs can restore trust in management and/or governance mechanisms.

2. Legal basis

7. In some countries WUAs are established under Cooperative Law, or as a Trust, Company Limited by Guarantee, or some other form of Voluntary Society, under which local government allows the WUA to oversee the facilities. This confers legal status on the WUA and underpins management stability. However, in many countries water supply and sanitation systems constructed by government, NGOs and others are handed over to a WUA without establishing the legal basis for ownership of assets and management of services.

8. Even where “handing over” is interpreted as transferring O&M responsibilities for the water supply, questions still need to be resolved. For example, what happens to the water system if the WUA is wound-up? And who owns the water source? Clarity on legal ownership makes it easier to resolve disputes at community level – a WUA guilty of malpractice can be sued by users, and a WUA can sue, for instance, a neighboring community over a damaged or polluted water source (Fonseca and Bolt, 2002). Legal authority is also needed to sign contracts, to open bank accounts and to access loans and grants.

¹ United Nations Centre for Human Settlements (Habitat) (1995) Compendium of Human Settlements Statistics. New York, USA

9. In essence, ownership in East Africa for piped schemes is described as *undertakership*, whereby the state transfers assets to local government, which in turn transfers O&M to local WUAs. In such situations, a performance agreement with conditions and duration needs to be signed between the Local Government and the WUA, as is done in the Kiliwater Ltd case in Tanzania (DHV, 2001).

Box B1.1 Legal basis for WUAs in South Africa and Tanzania

The Legal Resource Centre in South Africa suggests a range of legal forms for a Village Water Committee or WUA: Voluntary Association – governed by Common Law; Trust – Trust Property Control Act 57 of 1988; and Section 21 Companies – Companies Act 61/1973 and Communal Property Association Act 28/1996. Any of these can register as a non-profit organization (Act 71 of 1997). Other models are found in Tanzania. The WSC model used in Morogoro Region is a Company Limited by Guarantee and registered with the Registrar of the Ministry of Industry and Trade (See Annex A - Articles of Association). On the other hand, the WUA model found in Southern Tanzania is structured on a Cooperative model registered under the Ministry of Water (DHV, 2001). Finally, the Trust model found in Northern Tanzania is constituted with the approval of the Administrator General under the Trustee's Incorporation Ordinance.

3. Ownership, oversight and operations

Ownership

10. Although water systems are officially handed over to the community, local government typically retains ownership. Where the community has made a substantial contribution towards the costs of construction, or has invested over time, ownership is less clear. If local government remains hesitant or legally unable to transfer full ownership of assets, one option is to formalize shared ownership. The success of this shared ownership depends both upon the trust the user community has in the local government, and in the local government not exploiting its political power.

Shared ownership can ensure technical, legal and financial support from district authorities through their representation or advisory role on the WUA Board of Directors. This involvement of district authorities may increase the legitimacy and authority of the WUA management, as seen by the community/users, local politicians and leaders. Control by users over strategic decisions, and the sense of ownership this provides, are arguably more important than full legal ownership by users. For larger, more mature towns this seems to be less critical. For example, in Senegal there is a trend towards reduced democratic user representation. People appear increasingly content with the level of service they receive from the WUA for the charges they pay, and they are less inclined to demand a high level of direct representation and involvement. At this point delegated management becomes more likely, and regulation (to balance the interests of different stakeholders) more important.

Oversight

11. WUAs in small towns have a Board of Directors, sometimes also called a Water Board, responsible for management oversight of the WUA. The WUA-Board

represents all users, i.e. from the various ethnic and social groups in the user community. In less formal WUAs, critical weaknesses in organization are apparent, with the result that WUA-Board members lack incentives or direction, lose interest and no longer take an active part. The need to better define tasks and compensation of WUA-Board members becomes apparent as their responsibilities increase and reliance on voluntary work becomes less effective.

12. Under the more formal WSC model, roles and responsibilities are better defined, and qualified personnel are appointed to key posts. The Executive Board (or Team) of the Water Board usually consists of the chairperson, secretary and treasurer. They are responsible for general management oversight and for hiring/firing of professional staff including a manager, or contracting a private operator. Executive Board members may be satisfied with a nominal allowance, provided their function contributes to their status in the community/town as part of a successful community enterprise.

13. The interplay of status/trust in individuals is a characteristic of WUAs. In many countries, trust in the district and town authorities is limited because of past experiences. WUA-Board members on the other hand have their roots in the community, and are democratically elected. Their role calls for good communication skills, commitment and competence in carrying out their duties. Otherwise they are likely to be removed from office and the Board is unable to build corporate experience over time. Under the Uroki Bomang'ombe Water Supply Trust in Tanzania, for example, the Board is selected from respected religious leaders, and male and female educational and technical professionals.

14. One of the positive characteristics of WUAs is that autonomous governance by democratically elected community members creates a sense of ownership. It also underpins informed willingness to pay for a level of water service provision that is affordable to the specific user groups. In contrast, experience has shown that if governance is in the political sphere at local/town government level, users expect a subsidized or free service from the common perception that 'the government will not let us down' or 'the local politicians will guarantee water services'.

Operations

15. For their operations, WUAs in small rural towns tend to rely on local employees, including an accountant, a clerk and a number of operators/mechanics. Management oversight is not separated from day-to-day management decisions, and decision-making is poorly linked to accountability or to a coherent business plan. Weaker WUAs are characterized by a lack of qualified managers, and professional staff are not paid competitive salaries and often leave their posts.

16. In smaller WUAs, Board members may even take on 'professional' day-to-day tasks, often on a voluntary basis with only a nominal allowance. This voluntarism of the Board is effective for governance functions but less so for daily management and operations that consume much time, require daily commitment and specific professional skills. Hiring professionals pays back in the long term because they are directly accountable for their services and they have the potential to bring in the needed skills and efficiency.

17. In Tanzania, larger WSCs hire professional staff directly, while in smaller WSCs day-to-day operations are looked after by members of the executive board of the WUA with support from trained mechanics working on a voluntary basis. Contracts with employees do not include performance indicators which would help to improve operational efficiency. Performance agreements with Board employees should be mandatory in WUAs, and set a good precedent for potential contracts with a private operator as the town/system expands.

18. In many countries, the availability of professionals is increasing because of retrenchment of government agencies and an influx of young professionals. However, the numbers of experienced managers and operators prepared to work at small town level is often limited. An important role for a supporting Association/Federation is to fill this human resource gap by facilitating/providing training and backstopping – and acting as a conduit to share professional resources.

19. A common arrangement in Southern Africa (e.g. South Africa, Namibia) is that a Private or Municipal Water Authority sells bulk water to communities and towns. In the town/community, a Local Water Committee (the Water Service Provider) is responsible for distribution, routine O&M, billing and collection, and communication with consumers. The WUA model is therefore relevant for multi-village schemes, in combination with alternative management options for bulk supply. The bulk supplier takes care of many activities that would otherwise require specialist support, such as development, expansion and protection of source works, and treatment. In Senegal, there is a trend towards increased delegation of management of O&M for multi-village schemes (Niang, 2002). The government has a strong stake in the arrangements and the Directorate of Operations and Maintenance (DEM) requires that the maintenance of pumping systems is contracted out to a specialized region-based private company pre-selected and accepted by DEM (HydroConseil, 2002)

4. Professional support

20. It is unrealistic to expect that all managerial, technical and financial skills required to effectively maintain and operate a water supply system will be available at the small/rural town level. The oversight Board members and the managing /operating staff need support on an ongoing (but not necessarily continuous) basis. In Tanzania, WSCs are supported by a Federation. Table B1.2 gives a list of typical support and advice that WUAs need and which may be provided by a Federation or other higher level organization. The specific support requirements will vary in different countries/localities.

Table B1.2: Support services to WUAs

<p>Immediate:</p> <ul style="list-style-type: none"> ▪key service contracts, such as: borehole cleaning/redevelopment and pump maintenance ▪help in instituting water quality tests ▪planning and design of more complex expansion ▪access to and stocking essential spare parts (e.g. meters) ▪billing and collection ▪resolving issues, such as: unreliable power and non payment by public institutions ▪development of funding proposals ▪construction supervision ▪external financial and technical audit 	<p>Capacity building:</p> <ul style="list-style-type: none"> ▪independent advice to support better management and operations ▪training in financial management including tariffs and bookkeeping, and business planning... ▪training in routine O&M, such as: maintenance of moving parts, calibration of meters, disinfection of tanks, UFW and leak detection... ▪training for O&M of treatment works ▪planning activities, such as mapping and recording repairs and pipe breaks, recording customer complaints, managing demand... ▪conflict resolution and arbitration ▪negotiation with service providers (quality, price, payment conditions, etc.) ▪legal issues, such as registration ▪communication with government over policy issues, and support for autonomy
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21. Primarily the Federation is a professional association for all WUAs. It does not need all expertise to be in-house but can act as a reliable and trusted intermediary between the WUAs and other private or public sector service providers. Important parts of this network are national or regional resource centers, technical colleges and universities, who can provide relevant, user-friendly information, enquiry services, training and research. As with all support mechanisms, the financing of a Federation should be borne by users – in this case through WUA membership fees, based on an equitable formula such as water production or number of consumers.

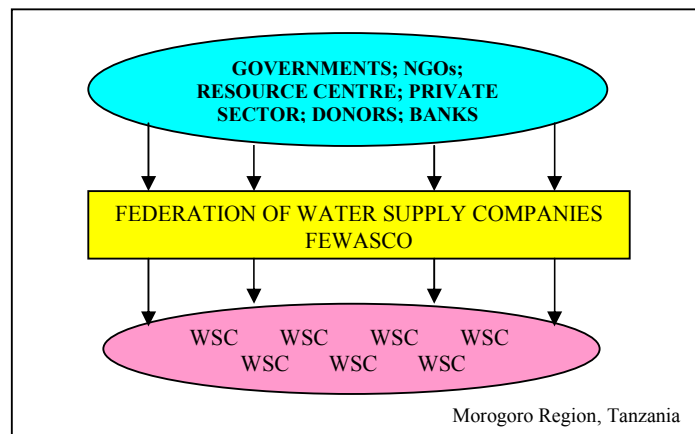


Figure 1. Proposed relationship between FEWASCO (Federation), supporting institutions and the WSCs (where possible, links between supporting institutions and the WSCs should be direct)

Cost-sharing arrangements and WUA aggregation

22. As a WUA gains practical knowledge and expertise, several institutional and organizational changes can be considered at a local level to take advantage of successful experience, and the growth of local capacity:

- A stronger, better organized, WUA can expand its business by taking on new ‘commercial’ responsibilities. For instance, it could provide specialist skills to less successful nearby small towns/communities. Or it may offer O&M services, or take on day-to-day management responsibilities in addition to O&M. Proximity of WUAs helps to reduce costs and would be an efficient use of resources.
- Another option would be that WUAs of two or more small towns merge to become a larger entity able to attract professional managerial and technical staff, but also to become more efficient in their procurement activities and operations through increased economies of scale. A new Water Board would be elected by members representing the user communities.

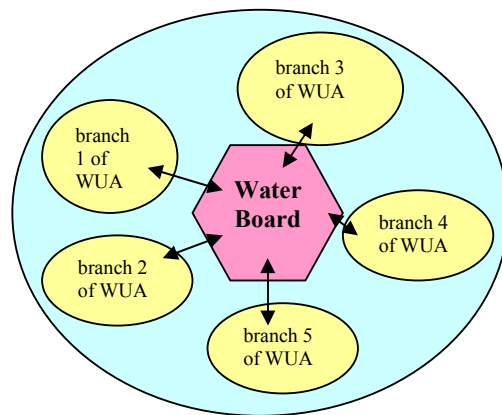


Figure 2: Merged WUAs forming a common Water Board

23. In Tanzania, WSCs have expressed the opinion that they are too recently established to consider these options. The ‘ownership’ of their WUA is still strong and they do not want to give up their autonomy, even if the organizational and financial performance is not sound. If the quality of water services were to come to a desperate level in a particular WUA, the sharing of knowledge and expertise may come up for discussion. In such a case, the facilitating role of a trusted body such as the Federation will be beneficial to the process.

5. Risk analysis

24. Poorly functioning WUAs tend to exhibit a lack of risk allocation, with risks ultimately transferred to users. More formal WSCs are better able to allocate risks, particularly when performance contracts are in place and responsibilities clearly assigned. A number of risks deserve specific attention for the WUA model:

- ***Technology and service level.*** Small towns systems under WUA management are often grant financed, with a percentage community contribution, but users take responsibility for O&M. Therefore a balance must be found between affordability of O&M costs and feasibility of O&M activities on the one hand, and preferred service levels on the other, taking into account the domestic and economic requirements of men and women users (Brikké et al., 1997).

- ***Water quality***
 In the rural settings that characterize many WUA-managed schemes, new human settlements and agricultural activities in the catchment area can quickly pollute the water source, as well as affecting discharge rates. Where a central water treatment plant is necessary, this will add financial and organizational pressures that may be beyond the WUA (a case of over-design mismatching local financial and maintenance capacity). Water source protection can be addressed at Federation level, because source protection is often beyond the scope and jurisdiction of a single WUA.
- ***Land rights***
 Land rights are a risk area that needs further legal attention in many countries. In Tanzania, for example, system assets remain the property of Local (District) Government, while land rights may be vested at town level (in the case of communal land or private land).
- ***Demand***
 Taking advantage of increased commercial/industrial and domestic water sales requires growth of the business (staff numbers, complexity of tasks, etc.), for which WUAs are often not well prepared. Support from Federation level or other higher level organization may be one solution. Where expansion does take place, inadequate source capacity is a serious risk and can threaten sustainability of the WUA, or simply limit the ability to meet demand. New residential areas need to be connected, but only where the capacity of the source and distribution network allow, otherwise service levels in the original service area will decrease. Partnerships with existing small-scale independent providers may be a lower-risk way to meet expansion demand for an interim period.
- ***Tariff adjustment and regulation***
 One of the great merits of WUAs is their relative independence in setting system-specific water tariffs. But this independence is only effective when there are sufficient and strong advocates within the community and among local political circles or traditional leaders. Water tariffs are generally proposed by the Water Board but need approval first from the Annual General Meeting (AGM) of Members, and second from the Local (District) Government. Transparency in tariff adjustments and advanced discussion with the community are critical (for example to absorb higher costs of electricity before revenues are run down). However, if the Board fails to convince the community of the need to adjust the tariff then revenues may not even cover daily O&M costs, leading to a negative spiral of non-payment for services, loss of revenues and deteriorating service standards.

Most WUAs have a simple water tariff schedule that distinguishes between domestic and commercial users, and between standpost users and those with house connections. Theoretically this results in cross-subsidization by commercial/industrial users to public standpost users, but care must be taken not to discourage high-volume users, who may then develop their own source.

- ***Water metering***
 Comprehensive metering programs in smaller towns suffer from lack of availability of new meters and lack of skills to calibrate faulty meters (which can quickly undermine user confidence in volumetric charges). But the advantages of metering over flat rates in terms of increased and equitable revenue collection are clear (CWSA, 2002). The Trusts in North Tanzania,² for example, claim that their strong financial and organizational stability is largely due to successful metering of all connections. In other parts of Eastern Africa, a flat-rate system is widely used, with a high risk of water misuse, and with high-volume users paying excessively low rates. The challenge of affordability of connection costs is particularly acute in smaller towns, but with clear regional variations. In summary, it is apparent that with universal metering users expect a more sustainable service with fair water charges, despite problems in calibration and replacement.
- ***Tariff affordability***
 The issue of capital cost contributions and tariff affordability is highly contested in smaller towns, which are often in areas classified as “rural” and “low-income”. Local governments are keen to provide services to their constituent communities, and may subsidize capital cost contributions or defer approving tariff increases. But, when successfully championed, the logic of community-based approaches permits communities to choose a level of service that they can afford to maintain, and within small rural communities, some form of informal cross-subsidization is often found. Even poor families are willing to pay higher tariffs if they are satisfied with the water services they receive, and if more water provides them with new economic opportunities.
- ***Operating cost, billing and collection***
 Most WUAs have a small revenue office where the clerk or accountant issues receipt against payments. A key to improved collection efficiency in small towns is that billing intervals are set to suit customers, who may not have a steady income stream. In WUAs with low collection efficiency, social peer pressure and realistic enforcement actions need to be introduced. In West Africa, a common system is to have kiosk caretakers pay the WUA for bulk water consumed. The caretakers then charge water collectors using a WUA-approved tariff schedule and retain the balance as income. In some countries (e.g. South Africa, Uganda, The Philippines) prepaid water meters or a coin-activated public water dispensing system have been introduced with mixed success (Vermeulen, in IRC, 2001).
- ***Financial management***
 One of the greatest risks faced by WUAs is misappropriation of revenue. The revenues generated by even a small water system are often well beyond the expectations of the community, and the WUA can come under considerable pressure to allocate funds to other community activities, or in the worst-case scenario to hand over control of revenues. WSCs in Tanzania counter misappropriation of funds by establishing a tight two-tier accounting system – accountant and treasurer plus both internal and external auditing. Such an approach improves accountability through financial reporting and builds the trust of users.

² Uroki Bomang’ombe Water Supply Trust in Hai District

6. Autonomy and accountability

Autonomy

25. In theory, WUAs should do well in terms of autonomy in relation to such issues as setting tariffs and reinvestment in the water system, because they are dedicated to water supply service provision. In practice, this autonomy can be undermined when the WUA-Board lacks legitimacy within the community, or is subject to manipulation by local political or social units, or traditional leadership.

26. In the case of WSCs in Tanzania, interference from local/central authorities can still have serious effects on the sustainability of the water provision. The possibility of this happening is reduced where management oversight is separated from day-to-day management and operations through contracts with professional staff or a private operator. Such contractual arrangements, together with improved accounting and financial audits, make it more difficult for irregularities to occur or for misappropriation of revenues and savings resulting from political or non-commercial pressures.

27. On the other hand, WUAs need support from local politicians in advocating institutional and legal change, creating an enabling environment for local entrepreneurs, and setting and enforcing appropriate regulations (Moriarty et al., 2002). In this respect, higher level organizations, such as Federations, can play a role in raising awareness amongst user/community members or highlighting cases of abuse by politicians (Fonseca and Bolt, 2002).

Accountability to the users

28. Accountability and transparency are not always straightforward to institute, and past experience with community organizations justifies a certain level of mistrust on the part of users. WUAs function properly only where the governance and management structure is stable and trust has been established based on performance. Reliable, clearly presented and timely communication is needed between the operator (or managing director) and the governing board, and between the governing board and the community. There must be sufficient opportunity and suitable mechanisms for users from all social groups to react to decisions and reports. This may be achieved via informal channels such as social groups, or simply reliable public announcements or notice boards.

29. In the context of WUAs, building management capacity is often a question of having sufficient time on the job to learn. Governance and management terms of tenure should be long enough to ensure that capacity is built and taken advantage of. A minimum term of three years is generally required to build experience, competence and confidence, with different posts replaced at different times to ensure continuity.

Box B1.2 External oversight boosts WUA accountability

The transparency and accountability of WUAs can be significantly bolstered by regular audits/monitoring undertaken by trusted agencies.

In **Benin**, the Regional Water Office (Services Regionaux de l'Hydraulique) that owns the physical water system assets monitors several functions of the local water committee. Analysis of the monitoring data indicates the 'viability level' of the performance of the committee. If this is too low then the regional office asks the committee to review operations/expenditures and consider whether a tariff adjustment is to be suggested to the consumers (Hartmann, in IRC 2001).

In **Mali**, Management Advice Units (GCS-AEP) make technical and financial audits. Each water point and every 10-20 household connections designate two delegates to the Users Association. They meet twice a year in a General Assembly, when the Management Board is elected and management decisions are made based on external annual or bi-annual technical and financial audits by GCS-AEP.

FEWASCO in **Tanzania** has started to support the accountability of WSCs by collecting monthly financial performance data. These help to benchmark financial performance among WSCs. (Kanshahu et al, 2002)

30. Proper communication procedures between the WUA-Board and all user groups - such as yearly reporting and open meetings - are crucial for accountability and transparency. These Annual Assemblies or General Meetings include a management report (progress, problems, solutions, and plans), a financial report (balance, income/expenditure, tariff adjustments and investment plans), an annual business plan, a vote of confidence, re-elections if needed, and discussions with users and/or members.

7. Regulation

31. WUAs arise in a decentralized context, but some regulatory functions must be centralized or require support from a higher-level organization including external auditing and benchmarking, and regulation of tariffs and water quality, as well as contracts. However, under a formal WSC structure many activities contribute towards better governance such as a higher level of professionalism leading to improved data management, and open communication and consultation. Other areas are poorly regulated at small town level such as sanitation and customer coverage.

8. Competition

32. In a decentralized context, WUAs face potential competition at a number of levels. In the first place, their status is often subject to performance agreements with Local Government who could in theory take over service provision through direct municipal management, or delegate the role directly to the private sector, or private operators under contract to other autonomous Water Boards may compete simply by showing success in neighboring towns. In small, rural towns there may be competition with alternative service providers (water vendors) or traditional sources of water particularly during rainy seasons. However, in most countries, water provision remains a relatively new area for the private sector, young mid-level professionals have limited experience and prefer to stay in larger towns/cities with better career prospects, and many retrenched staff from government departments lack

business-skills needed to enter this job market. This picture will gradually change over time.

33. Private operators are not interested in contracts with informal WUAs in individual towns, and in any case WUAs often lack the legal basis to contract an operator. But the more formal WSC model may be attractive to them, especially when small towns are aggregated for procurement purposes then have individual contracts with the operator, or where a number of WUAs have chosen to merge their service provision. However, private companies from outside small rural towns are not always trusted by WUAs in terms of integrity (fees, quality of product...), and their costs may exceed the affordability of small WUAs. A Federation may be able to help in contracting and control of product quality.

9. Financing

34. On their own, WUAs cannot raise the funds to build a new system or to rehabilitate an old one. Most community-managed systems are financed from a combination of community contributions, local government grant, central government (project) grant, and perhaps private investors. WUAs may also need help to finance expansion or renewal and replacement. Subsidies, grants, soft loans, and credit guarantees are common mechanisms.

35. In principle, water tariffs should cover the major repairs, renewal and replacement, upgrading and expansion of the water system. But it may not be wise to build up large financial reserves that may not be used for some years. This is especially so in a relatively poor economic environment with high inflation and risks of devaluation. Large reserves also inspire misappropriation, and so WUAs are better advised to take loans and factor repayment back into the tariff. However, one of the major challenges that small towns face is in securing loans. They need coherent business plans to establish credit-worthiness, which may also require stable legal status, possibly ownership, (limited) guarantee by local or national government, and evidence of good WUA governance/management from external audits over some years.

36. In South Africa, communities can apply for funding from national/international sources through financing intermediaries such as the Mvula Trust. In Namibia, Zambia (see Box B1.3) and Tanzania, water and sanitation trust funds are under discussion, or are being established.

Box B1.3 The Zambian Devolution Trust Fund

In Zambia, the National Water Supply and Sanitation Council is considering establishment of a Devolution Trust Fund - Water Supply and Sanitation Act No. 28 of 1997. This Trust Fund will make funds available to Commercial Utilities (which can include WUAs) that have taken over the responsibility of water supply service provision from local authorities. The Trust Fund will (co-)finance the rehabilitation, expansion and extension of piped water supply systems. The National Water Supply and Sanitation Council will manage the Trust Fund (personal communication O. Chanda, Director NWSSC, 2003).

37. Access by WUAs to credit from development or commercial banks is quite difficult and therefore exceptional. Banks do not yet interpret WUAs as creditworthy. On the other hand, loans against affordable interest rates would help WUAs improve financial management through the lenders' control systems and reporting requirements.

38. One option to expand the network and make water services available to new quarters of a town is to sell the right to develop and manage the water supply to a private company. At a later date, the additional water supply (typically through boreholes) can be integrated into the main distribution network, and the private company paid for the assets (Vezina, 2000).

10. Limitations

39. The WUA model has great potential for serving small rural towns with a population in the 2,000-20,000 range. In its development towards a more formally structured organization (such as the WSCs of Tanzania), it represents a transition model from smaller, rural towns to larger, more urbanized towns. Its great strength is the close involvement of users, which creates trust in management decision-making and ensures willingness to pay for services, with the autonomy to set tariffs. WUAs have a clear responsibility towards all groups within the society, including low-volume, low-income users, as stipulated in their Articles of Association. Through the AGM, everyone has a say in strategic decision-making such as tariff adjustments and new extensions.

40. As towns grow, this direct participation becomes more difficult to manage effectively, and a more formal management organization is required as well as contract-based responsibilities. In any case, once a town reaches a certain size and takes on a more commercial nature, direct user involvement becomes less important, and most customers just want a good reliable service at an acceptable price. At this point, delegated management under a fully autonomous Water Board model becomes more likely, and more formal regulation is required to ensure equitable service.

Table B1.3: Analysis of WUA model against key ingredients for success

	WSC (Tanzania model)	Reasons
Ingredient for success	Rating from 0-5 (5 is the highest rating)	
Financial and management autonomy	4	Risk of interference from local politicians/leaders and local government, especially when the legal basis of WUAs has not been formalized.
Competition	2	Hired or delegated management capacities for WUAs are not commonly available as yet.
Demand responsiveness (including service to low income households and gender-specific demands)	4	Technology and service level are linked to affordability and sustainability; also poor users have control in strategic decisions of WUAs
Incentives for expansion	3	Social mission is important Article of Association; if new residents demand then WUA must react. Limited accessibility to funds may be hindering factor.
Professional support	2	In most countries not well organized although options available. Many WUAs try to solve the problems on their own!
Regulation	2	Often no regulatory framework by national/local government; WUA and users regulate through AGM with some pressure from local politicians.
Transparency and accountability	4	Governors report back to 'owners', the members/users in AGM. Reporting procedures and systems not always adequately developed.
Enabling Environment	3	Legal framework required for autonomy of WUA; and financial support structures etc.
Capacity building	3	Only if a Federation/Association (against payment) or the government can provide this required service

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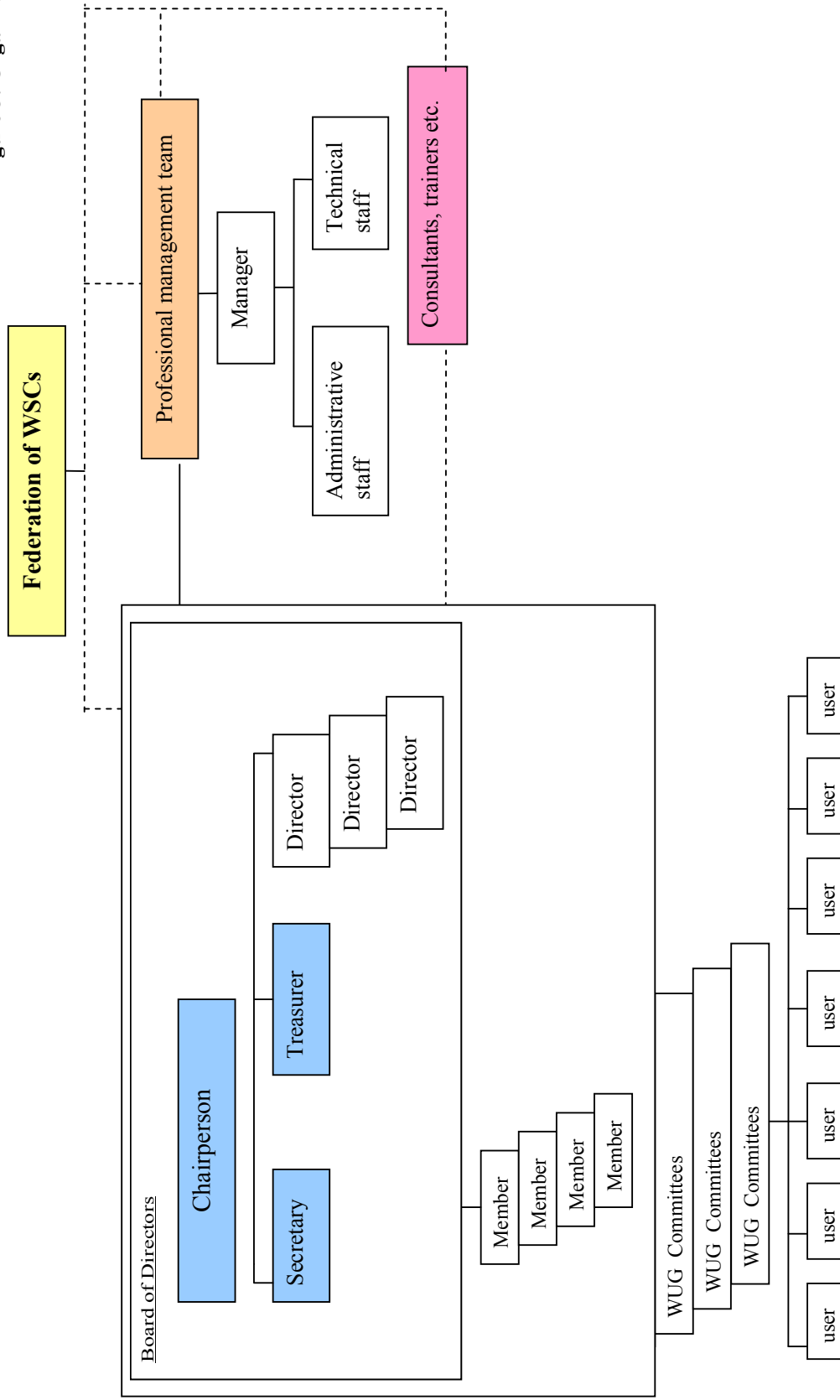
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Figure 3: Organization



**Town Water Supply
and Sanitation Services
Volume 3**

Municipal Water Departments

Companion Paper B2

**Klas Ringskog
March 2003**

The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and should not be attributed in any manner to the World Bank, to its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent.

Companion Paper B2: Municipal Water Departments

**Klas Ringskog
March 2003**

1. Introduction

There are two main ways in which a municipal water department may come into being: from the bottom up; or from the top down. In the first case, the transition occurs when a community-based water system, perhaps managed by a Water User Association (see Companion Paper B1), grows in scale and complexity. The need then arises for a more formalized organizational structure, able to meet the needs of commercial as well as domestic consumers and to plan water and sanitation improvements in the context of overall community development. The municipal authority then seems the logical choice to bring legal authority, organization, transparency and accountability. The second route is through decentralization. As central governments discover the limitations of national water and sewerage agencies in operating and managing systems to serve widely dispersed small towns, responsibility is delegated downwards, ending with the local municipality. That is the process that led to the establishment of municipal water departments as the favored solution for serving many Latin American towns in the early 1990s.

The 1980s has been named “the lost decade” in Latin America and rightly so. Practically all the region’s countries defaulted on their foreign debt, and income levels and investments dropped. One of the results of the crisis was a re-examination of the centralized development model that had preceded the crisis. The water supply and sanitation sector had been no exception. Until the mid or late 1980s, the sector had for the most part been managed by national water supply and sewerage agencies such as Obras Sanitarias de la Nación (OSN) in Argentina; the National Housing Bank in Brazil (with state companies operating the infrastructure financed under the PLANASA financial model); SENDOS in Chile, SENAPA in Perú, SARH in Mexico and INOS in Venezuela. A reaction set in and country after country chose to decentralize their services to the municipal level. For instance, a new Brazilian constitution was adopted in 1989 and gave municipalities the obligation and right to provide water supply and sanitation services. The Colombian constitution of 1991 also made the municipalities responsible for providing these services, directly or indirectly. In contrast, Chile opted to create 13 regional water supply and sewerage companies to operate and invest and did not decentralize to the municipal level.

For those countries that did follow the municipal route, it did not generally turn out to be a successful experience. Indeed, Colombia’s 1991 Constitution was complemented in 1994 by the Law 142 on Public Domestic Services. That Law implicitly assumes that only in exceptional circumstances will direct municipal management be competitive with other management models. Article # 5 of the Law confirms that the municipalities are responsible for providing – among other basic services – water supply and sanitation

services. However, the assumption is that each municipality will do so by inviting specialized Public Service Companies (EPS) in a public bidding process. Article # 6 allows for *direct municipal management* only in cases when: (i) no EPS has shown interest; (ii) no other municipality or provincial service provider has offered to provide the services; or (iii) the municipality can demonstrate, to the satisfaction of the Water Supply and Sanitation Service Regulator (the Superintendencia), that direct municipal management is more efficient than an EPS. Where there is direct municipal management of water and sanitation services, municipalities are obliged to keep financial accounts separate from the rest of their operations.

2. Lessons from the Latin American experience

A dozen or more years of municipal management have exposed some major shortcomings in the basic model. The results suggest that direct municipal management should be treated as a last resort solution and that, when it is adopted, the municipal water department should be safeguarded from political interference and able to offer continuity of employment or contracts to skilled professionals. The cautionary notes from the Latin American experience, include:

- **Unclear ownership.** In theory, decentralization includes transfer of assets – usually financed by central government grants – to the books of the municipal authority. In practice, especially for smaller municipalities, it is often difficult to obtain an updated list of the assets, their location, their age and make, or their state of repair. Absence of reliable and updated data on assets causes difficulties when additional investments need to be designed, when insurance cover is sought, and when the assets need to be maintained or even repaired.
- **Political influence.** In smaller municipalities, the Municipal Water Department is directly under the Mayor or the Municipal Council and in larger municipalities under a Public Works Department or the like. In each case, water supply and sanitation services are under the direct oversight of elected political officials. Accountability of the water department to the municipal officers is for the most part imprecise and not based on any business plan with agreed performance targets. Rather, the water department is often used as a political tool, with councilors or the mayor appointing political allies to operate the water system and even employing large numbers of staff and workers before an election. The appointment of managers and even unskilled staff becomes a function of political affiliation and loyalty and not of professional capabilities and performance. The consequence is instability in staffing. In Colombia, staffing turnover is really excessive because of the short political mandate of municipal mayors – three years – and because mayors cannot be directly re-elected. When the manager of the municipal water department is a political ally of the incoming mayor, when (s)he knows that (s)he will only be in post for three or four years, and when (s)he has never been exposed to managing a water supply and sewerage system with its technical, financial, commercial and administrative complexities, it is hardly surprising that (s)he will opt for keeping the operation afloat rather than

improving standards, expanding services and delivering quality.

- **Scarcity of professional support.** Because of their local nature, their governance and their small size, municipal water departments are at a disadvantage in trying to secure professional support. Attracting professional staff from outside the municipality is difficult, since tenure shorter than the political mandate of the mayor is unattractive to professionals who value a long-term career. Politicization of staffing also means that scarce professional capacity cannot be spread over a larger number of municipalities and the result is higher costs per served customer – economies of scale are foregone.
- **Lost economies of scale.** Economies of scale are important in quite a few aspects of water system costing. If political interference inhibits resource sharing among neighboring municipalities, the lost economies include savings on: management costs, which rise in proportion to the number of households to the power of 0.5 (economy of scale factor 0.5); commercial costs (factor 0.6); information services (factor 0.5); and financial and general services (factor 0.7). All these economies of scale are lost if a municipal department is operating the water supply and sanitation services in isolation.
- **Lack of financial autonomy.** A municipality's water supply and sanitation system is one of the few local services that has a tradition for billing and collecting money for its services. Frequently the Municipal Water Department's cash from water supply and sewerage billings is not separated from the municipality's general cash. There is a strong temptation for the municipality to "borrow" from this cash to pay for salaries and for running expenditure of the municipality itself. The risks of this happening are considerable where municipalities have a weak revenue base with few local taxes. This kind of "borrowing" is not restricted to small municipalities. A recent example has been the Antalya municipality in Turkey, a city of about one million inhabitants, where the municipality repeatedly "borrowed" from its water supply and sewerage operations. It goes without saying that such "borrowings" are often done without explicit stipulations on repayment terms.
- **Problems with borrowings or subsidies.** Finance for operating, maintaining and expanding a municipality's water supply and sanitation system can only come from three sources: the surplus of the operations themselves; borrowings; and outside subsidies. If first is diverted for other purposes within the municipality, the cash-strapped Water Department is left with borrowing or waiting for a government subsidy. Neither is a good option. Borrowing is difficult wherever a Municipal Water Department does not have an operating cash surplus that could be used for debt service. Lack of administrative sophistication and unclear administrative arrangements also make borrowings problematic. The possibility of central government subsidies remains. However, there is brisk and competing demand for free money and the wait can become a lottery. The upshot is inefficient and uncertain investment planning and implementation. There is also a

tendency to expand system capacity by an uneconomically large margin since it is difficult to predict when the next opportunity for public largesse will present itself. This pattern of investment behavior has a cost in excessive and unbalanced system capacity.

- **Deferred maintenance.** When operations are starved of cash, the first result is for the Municipal Water Department to reduce expenditure where the consequences will be felt the least. This is not likely to be their own salaries or payments for electricity, chemicals and the like, where suppliers are apt to cut off services. It is far more likely that maintenance expenditure will be pared, because the effects will not show for some time. Eventually, lack of maintenance will lead to increasing breakdowns, higher leakage and poorer service quality. The end result will be a need to rehabilitate or replace the deteriorated system, which is poor economy. It is estimated that an annual maintenance expenditure of 2% of the replacement value of an existing system will retain the system in good operating order for the foreseeable future. The capitalized cost of an indefinite stream of such annual maintenance is just 20% of the replacement cost that will be incurred if there is no regular maintenance (capitalized at a 10% discount rate). The conclusion is that deferred maintenance is an economically poor decision.
- **Regulatory limbo.** National regulation of the efficiency, quality and cost of water supply and sanitation services tends to be applied equally to all municipalities irrespective of their size. This is certainly true in Colombia, where no allowance is made for small municipalities through simplified reporting or through more lenient service standards. In practice, the process breaks down and the small municipalities are unable to respond to their duties under the regulatory system. First, they are often unable to complete the reporting that is required to request sanctioned tariff increases. Second, they are at times unable to respond to the citations for service standard violations that the service quality regulator, the *Superintendencia*, may serve. The upshot is a regulatory limbo that *de facto* leaves smaller municipalities with Municipal Water Departments partially unregulated. The main reason is not unwillingness on the part of the Municipal Water Departments to be regulated. It is their lack of professional and financial resources to respond effectively to the demands of regulation.
- **Lack of competition.** A municipality that manages its water services directly through a Municipal Water Department has chosen to forego competition from alternative service providers. It has opted to restrict the pool of experience, ideas and professional qualifications that competition could supply to operate and maintain the system, serve and interact with consumers and expand system capacity. The results will be professional stagnation and in all likelihood service quality and efficiency will suffer. The effects are all the more damaging if the Department remains in a regulatory limbo where it cannot assimilate and benefit from the lessons of comparative, yard-stick regulation, where its own performance is compared with that of other municipalities.

- **Exposure to risk.** Allocation and mitigation of the most common risks of water supply systems is straightforward, but somewhat uncomfortable, for municipal water departments: the municipality is in the end forced to absorb all the risks, as Table B2.1 shows. The consequences are serious as there is limited scope for mitigating risk since there is no contract with outside firms, except where construction is competitively procured and undertaken by private contractors. Even the latter may not always happen in municipal water departments that sometimes build up in-house construction capacity. The use of *contra plans* or agreed performance plans between municipal councils and municipal water departments has been shown to be ineffective because of the difficulties to achieve meaningful control and sanctions between parties of the same political affiliation and where municipal water departments are perceived as legitimate spoils of the political system.

Table B2.1 Risk Allocation and Mitigation under Municipal Water Departments

Type of Risk	Risk Allocation	Risk Mitigation
Raw Water Quantity	Municipality	Difficult to achieve
Raw Water Quality	Municipality	Ditto
Potable Water Quality	Municipality	Ditto
Effluent Quality	Municipality	Ditto
Land Rights	Municipality	Ditto
Demand Risk	Municipality	Ditto
Tariff Regulation Risk	Municipality	Ditto
Collection Risk	Municipality	Ditto
Operating Cost Level	Municipality	Outsourcing with qualified service contractors if financial credibility and legal status of Municipal Water Department permit doing so
Financing Risk	Municipality	Difficult to achieve
Construction Risk	Municipality	Contracting with qualified contractors

7. Regulation

8. Competition

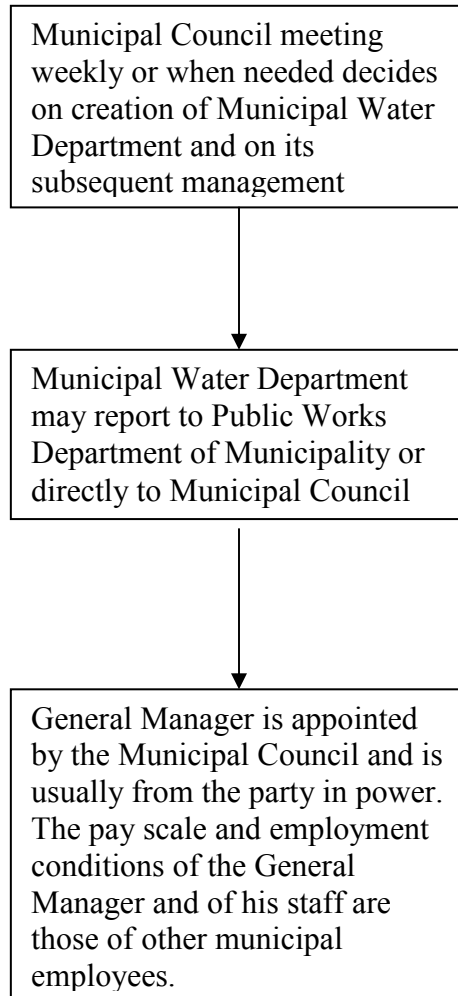
11. . A Municipal Water Department that selects not to open itself up to competition will fall behind the technological development in the sector, particularly so when prospective competitors would not even offer their services to Municipal Water Departments that are perceived as extensions of politicking municipal councils.

3. Potential for Replicability in Developing Countries

However logical it may seem, direct management of water and sanitation systems by a municipal water department has been shown to have hosts of problems in Latin America and elsewhere. The model is most suited to a size and complexity of system that will not demand much of the professional qualifications of the staff operating and maintaining them. Even then it begs the question what advantages municipal water departments would have over regional systems operated either by government agencies or by private sub-contractors. It appears that municipal water departments are the residual management model where other models have not proved possible.

A demonstration that municipal water departments can be regarded as a transitional management model until such time that publicly or private operated regional companies are feasible is offered by the PLANASA model in Brazil and by the regional water supply and sewerage companies in Chile. These two countries in their sector reforms in the early 1970s and the late 1980s, respectively, took note that individual municipal water departments would not be financially and professionally viable. In order to take advantages of the economies of scale and to leverage scarce professional capacity, both countries elected to create state water companies and regional water companies, respectively. This lesson seems to have been lost on many countries in Latin America that are still pursuing a model of decentralization to the level of municipalities. These countries include Colombia, which pins its hopes on private service providers emerging for all of its municipalities and Honduras that does not seem to have analyzed the feasibility of direct municipal water departments well. The likely result may well be deterioration of the smallest systems and eventually agglomerated regional management or even national-scale management in the smallest countries where geographical distances are small enough to permit effective control and support from one central office.

Organizational Diagram of Municipal Water Departments



Key Stakeholders, Roles and Responsibilities

Municipality	Municipalities with the constitutional prerogative and obligation to create municipal water departments may elect to do so
Municipal water department	A department like any other within the municipal administration established for the explicit purpose of operating, maintaining and expanding the water supply and sanitation system.
Regulators	The quality regulation is usually carried out by the Ministry of Health regarding the adequacy and safety of the drinking water supplied, and by the Ministry of the Environment regarding the compliance with effluent standards. The economic regulation is the responsibility of the national water supply and wastewater regulator (if it exists) or of price boards or commissions or the like.
Consumers	Are obliged to comply with the customer regulations, foremost paying the tariffs approved by the Municipality or by the National Economic Regulator (for instance in Colombia)

Key Ingredients for Success

Ingredient for Success	Rating	Reasons
Financial and management autonomy	1	A municipal water department has no autonomy under the Municipal Council that has created it. It is subject to the political changes and instability that buffet any municipal administration
Competition	1	A municipal water department has a monopoly within the municipality which it can enjoy or abuse within the limits of patience of the Municipal Council and its voters
Demand responsiveness (including service to low-income households)	3	The fact that a municipal water department is local in nature and established by the politicians elected by the voters should make it responsive to all potential consumer demand within its power and faculties to respond to it
Incentives for expansion	2	The monopoly position and the often precarious financial position of municipal water departments limit the incentives for expansion
Professional support	1	The municipal water department can draw only on the experience and staff who enjoy the trust and support of the political faction in power
Regulation	1	The fact that its management may perceive their mandate to last only as long as the current municipal administration may limit its possibility to respond to demands from the regulatory agency. Similarly the fact that there is no explicit direct performance contract between the Municipal Council and the municipal water department makes contract regulation a moot point
Transparency and accountability	1	Ditto
Summary rating	1	A municipal water department represents the lowest level of management model of municipal water supply and sanitation systems

Legend: 1 denotes the lowest rating and 5 the highest rating in each category

Recommended Case Studies and Literature

In English:

Project Appraisal Document of the Colombia Water Sector Reform Assistance Project of US\$ 40 million, World Bank, September 27, 2001 provides an analysis of the dilemma of small municipalities and their management options

In Spanish:

Law 142 of 1994 of Domestic Public Services in Colombia analyzes the options of municipalities to discharge their responsibility of providing water supply and sanitation services to their populations

**Town Water Supply and
Sanitation Services
Volume 3**

Water Boards

Companion Paper B3

**Bruno Valfrey & Bernard Collignon
March 2003**

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Companion Paper B3: Water Boards

Bruno Valfrey & Bernard Collignon
Hydroconseil

1. Introduction

This paper describes an organizational arrangement under which an independent **Water Board** delegates water and sanitation services to a **Private Operator**¹ under a management, lease or concession contract². The paper presents lessons based on country experience mainly from Africa (including Ghana, Mali, Mauritania, Niger, Senegal, Tanzania and Uganda).

The Water Board management model is usually found in the following situations:

- In small and medium-sized towns with populations of between 10,000 and 50,000 and some larger towns of up to about 100,000 population;
- Where public administration is mature and active (Municipal Council, District Assembly, etc.), and the Water Board is established and supported by these existing institutions³; and
- Where the situation has evolved from a community-based Water User Association (WUA) that is locally staffed, to a more formal Water Board with delegated management⁴ (and where there may be only some nascent form of public administration).

The model has good potential in meeting several key ingredients for success⁵:

- Good accountability and transparency through direct representation of users (as with Water User Associations the Water Board is an elected body, or it has a mix of appointed and elected members), and services are provided to match users' demands;
- Relative autonomy of management oversight, and of day-to-day management and operations; and
- The operator is selected in order to provide professional skills needed to sustain and improve service delivery under formal contractual arrangements.

¹ In this paper, "private operator" refers to a local (but in most cases formal), independent operator and not a large international water company or a subsidiary of such an operator.

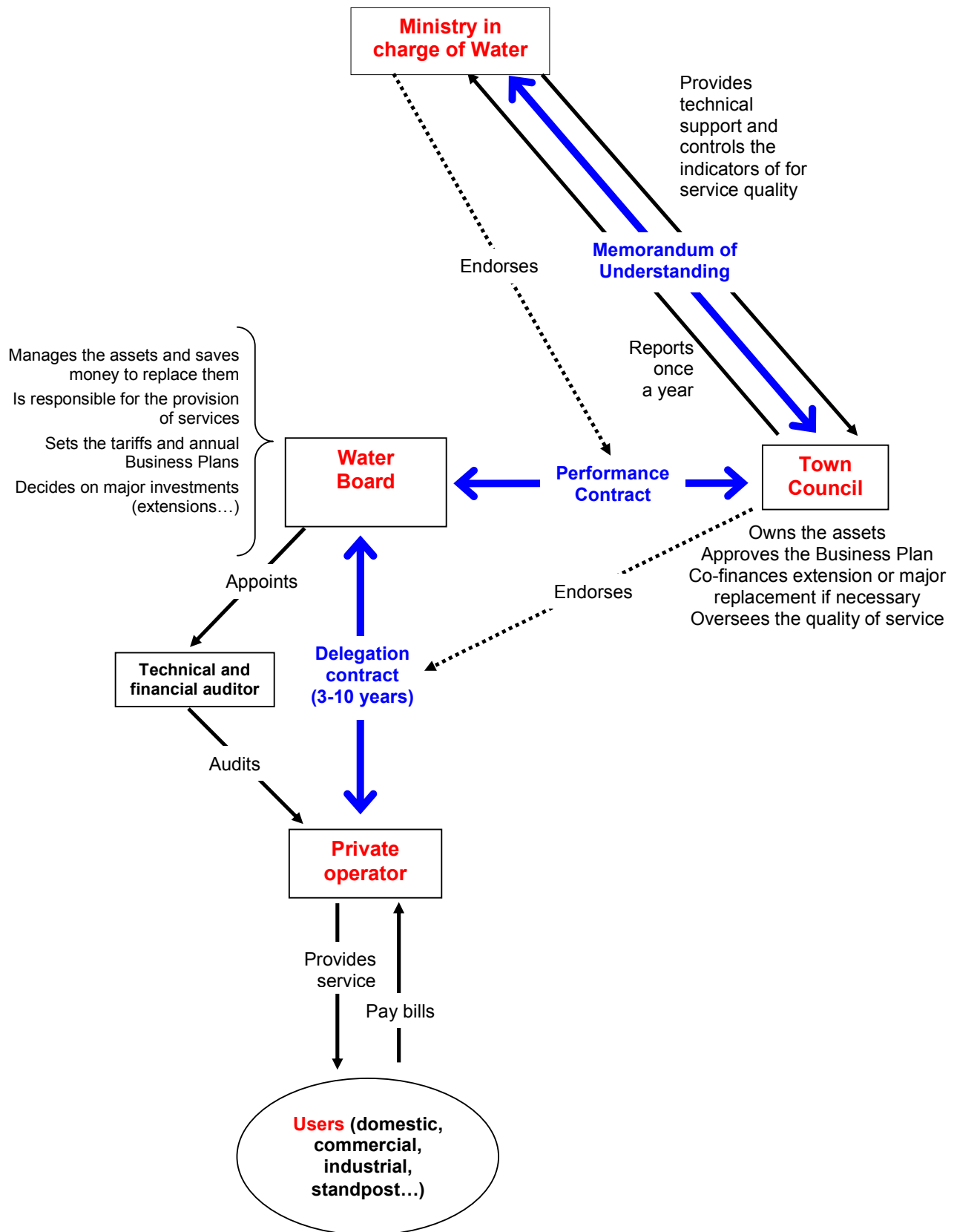
² The paper deals with an independent service provider contracted by the Water Board, and not with professional staff directly hired by the Board (which is not "delegation"). The three types of contractual arrangements mentioned (management, lease and concession) are only a convenient classification. Real "concessions" are rare for small towns, but some contracts may include concession-oriented clauses (e.g. the operator is asked to invest in the pumping system and own it).

³ As distinct from an independent community-based organization like a Water User Association (WUA).

⁴ A transition phase could be a situation where the Water Board directly hires staff (e.g. a manager, a clerk, an accountant, a plumber, a meter reader, etc.). In many countries (Senegal, Benin, Niger, etc.), the WUA/WB "hires" its own members, but this kind of situation should be avoided / clarified as soon as possible because without formal performance contracts/agreements the arrangement is unstable.

⁵ For an overview of "key ingredients for success" see the Proceedings of the Addis Ababa International Conference on Water Supply and Sanitation in Small Towns and Multi-Village Systems, held in June 2002.

Organizational diagram of the Water Board management model



2. Legal basis

The legal basis of this model is relatively simple, but may depend on a variety of existing laws and regulations, especially where the country is undergoing decentralization and the Government is progressively transferring responsibilities to local government and user associations. Among these rules and regulations we can list:

- The “**National Water Policy**”, which typically outlines the role of government agencies and local government, encourages representation of users and their obligations to pay user fees and includes details of the policy on Private Sector Participation.
- The “**Local Government Act**” which transfers responsibility of service delivery from central government to local authorities. In some cases, the local authority has responsibility for organizing the water service, but cannot provide the service directly through a municipal body, and is therefore obliged (e.g. Mali) to delegate management to an independent entity, which could be an association, a water board, a private operator or an individual (“*entreprise unipersonnelle*” in French-speaking countries).
- The “**Bye-Laws**” (or equivalent), through which the town establishes the legal status of the Water Board, and invests it with ownership and oversight responsibilities. The bye-laws enable the Board to own assets, to open a bank account, to take loans, to sue/be sued, and to procure goods and services.

If responsibilities have not been clarified by existing laws, the legal issue must be addressed directly by the main stakeholders, through:

- A “**Memorandum of Understanding**” (sometimes called a Performance Contract) between the central government and the local authority, which details the conditions for the delegation of responsibilities and/or handing over of assets to the local authority.
- A “**Performance Contract**” (in the absence of bye-laws) between the local authority and the Water Board, which details the share of responsibilities between the two bodies.

Lastly, the WSB will contract an operator:

- The “**Delegation Contract**” (management contract, lease, etc.) between the Water Board and the private operator (see organizational chart for more details).

3. Ownership, oversight and operations

Ownership

Ownership of assets is closely linked to the legal framework and sources of financing. Typically the assets are owned by the local authority (through the Local Government Act, or MoU), which has overall responsibility for provision and quality of public services including water and sanitation. However, in many countries (e.g. Senegal, Mali), the water resources (and the boreholes, dams, water catchment works...) remain in central government's hands. Through bye-laws, ownership is vested in the Water Board, subject to performance.

Oversight

Bye-laws establish the Water Board as an autonomous corporate body, distinct from the local authority itself, and with financial and management autonomy⁶. Board members may be either elected or appointed and are directly answerable to all stakeholders. The Water Board oversees water and sanitation service provision (mainly water in most cases, because sanitation facilities are limited in small towns) in the name of the local authority.

Depending on the Water Board's degree of independence, strategic decisions (including tariffs and investments) are more or less shared with the local authority from which approval may be required. The extent of local government involvement in such things as setting tariffs must be clearly stated in the bye-laws, but in any case the Water Board's finances must be ring-fenced.

All socio-economic and gender categories of users should have elected representatives on the Board. This is a condition that underpins broad-based social support for the model, and is a key factor in sustainability. Users should also be consulted during planning and design phases because they will have to pay for the water, and prices depend on the level of service and the professional support option they choose.

Box B3.1: Tanzania: proposed Water Board composition in small towns

a) Representatives of the Local and Regional Administration:

- The Regional Water Engineer (as a representative of Central Government)
- The District Executive Director (DED), as head of the local administration
- The District Water Engineer (DWE), or similar, who may be hired by the District if the District can freely manage its own personnel

b) Representatives of the Users (elected at the most appropriate level):

- A representative of commercial or private users
- A representative of "domestic" consumers (preferably a woman)

These two representatives would be residents of the town.

c) Representatives of the District Council:

The District Council would appoint two District Councilors. At least one would be a woman. At least one would be resident of the town.

It is important to ensure that Water Board members have some qualifications – otherwise there is an imbalance in water service management knowledge between the Board and the managing director of the contracted private operator. The competence of the Board is also critical to ensure effective internal regulation/auditing and oversight of the operator. A difference between WUAs and Water Boards is that the local authority is more likely to appoint qualified representatives to a Water Board, and this can provide important professional guidance.

⁶ In practice, the Water Board may be dependent or under obligation to the local authority for financing, and the local authority may have representatives on the Board. In this case, financial and management autonomy is not robust.

Operations

The most successful Water Boards are those that respect a strict separation between asset ownership and service oversight⁷ on the one hand, and the day-to-day management and operations on the other. Whenever possible, local private contractors/operators should be asked to invest in the improvement / expansion of the system (extension of the network or installation of new public taps and house connections). This last point means that the most suitable type of contract would be a "lease" contract (*affermage*) between the operator and the Water Board, with a minimum duration of 3-5 years (in order to attract private investors⁸). In practice, a management contract may be more feasible to begin with, and would be a good start (potentially becoming a full lease contract after a few years, if the objectives of the previous contract have been reached)⁹.

To encourage efficiency in water and sanitation service delivery, the private operator, whatever the type of contract, should be remunerated on the basis of service performance. This is measured by a small number of carefully chosen indicators (e.g. volume of water sold¹⁰, service time, number of new house connections, unaccounted-for water – UfW...). These ensure that the private operator not only delivers a good service but has incentives to reduce operating costs and pass the benefits on to users.

Box B3.2: Uganda: management fee for a Private Operator under a lease contract

The fee structure has five components:

- A base fee (fixed amount per month) to help cover fixed expenses
- A water sales fee (in USH per m³) to encourage an increase of water sales, and coverage
- A billing fee (in USH per month and per connection) to develop metering and maintain a reasonable recovery rate
- A pipe network maintenance fee (in USH per month and per km of pipe) to keep "technical" losses at a fair level
- A new connection fee (in USH per new connection) to encourage the operator to develop higher standards of service (private connections rather than public kiosks)

⁷“Service oversight” means both accountability and responsiveness to users, and that contract provisions are respected by the private operator.

⁸ When we are speaking about « investment » in small towns, it remains under the condition of a strong public investment (loan contracted by the central or local government, covering 50 to 90% of the capital cost and especially heavy investments such as catchment or storage works and main distribution network). In many African countries, recent experience has shown that even small-scale providers are able to invest funds to improve the facilities (pumping system, house connections, extensions to new settlements, etc.).

⁹ A good example of lease contract is provided by the experience of Niger (see bibliography)

¹⁰ Volume of water sold is not a good performance indicator *per se*. But in small towns, the systems are usually recent and require important extension works to meet new customers’ needs. In other terms, the water market is usually expanding in small towns, under the combined effects of demographic growth (which means new customers to serve) and per capita consumption increase (related to changes in behaviors).

This system encourages the operator to evaluate expected revenues and develop the service (by connecting new users and by increasing the amount of water sold).

4. Professional support

In cases when the Water Board hires individual staff, there may be a need for additional technical assistance. For example, maintenance of pumps may be sub-contracted to the pump supplier or a specialist mechanic. But, as explained above, the main purpose of delegation lies in securing the services of a private operator who has enough skill to take charge of all technical aspects of the water service operations, including maintenance, provision of spare parts, etc., or to secure these services as needed.

Consequently, in the Water Board model, professional support is more critically needed by the Board rather than the operator, in particular for business/ commercial aspects: preparation of the business plans including investment and financing plans; setting and updating tariffs; performance monitoring, etc. The main issue to be addressed is who provides the professional support and how, and who pays for it and how? The best option is to finance it through the tariff, possibly with a special fee (this option has been chosen in Mali to finance the CCAEP¹¹: 20 FCFA (\$0.03) per produced cubic meter).

¹¹ For further information about CCAEP see the poster presented during the Addis Ababa Conference.

5. Risk analysis

The model provides for appropriate sharing of the various risks associated with delivery of sustainable water and sanitation services. As the table shows, the Water Board and the municipal authority are able to transfer some risks to the contracted operator, for corresponding compensation in the fee structure.

Type of risk	Risk allocation	Risk mitigation
Raw water quantity and quality	Local or central government and/or WSB	Public investment may be required to finance boreholes and catchment works, if these works are beyond the investment capacity of targeted (small scale) operators.
Social risk Groups of users and/or the local authority refuse to delegate the service (e.g. for political reasons) Employees or civil servants of former water service management bodies fear losing their jobs.	WSB	At the town level, all stakeholders must be involved during social mobilization. Study tours could be organized to towns where delegation has proved successful.
Demand risk During the elaboration of the business plan/investment plan, demand may have been over-estimated. This poor assessment could drive the private operator to quit the business, cancelling the contract or increasing tariffs excessively.	WSB/Operator (depends on the contract type)	The demand assessment must be confirmed during the first stages of implementation. Household surveys can be carried out to obtain a more accurate estimate of willingness to pay and expected level of service.
Competition with existing private operators In many towns service is already provided by SSIPs (Small Scale Independent Providers).	WSB/Operator (depends on the contract)	Existing SSIPs must be targeted as a specific group of stakeholders during mobilization activities. "New markets" (= areas that are not served by the network) should be identified, and some distribution points can be allocated to SSIPs, under a "bulk" tariff.
Potable water quality	Operator	Monitoring and control by independent entity
Effluent quality	Operator	Monitoring and control by independent entity
Tariff regulation risk	WSB/Operator	Professional advice and support to achieve sound and realistic business plans
Collection risk	Operator	Innovative commercial practices and good "marketing"
Operating cost risk	Operator	Professional advice and support to reduce operating costs, and contract based incentives
Financing risk	WSB / local authority / operator	Depends strongly on the type of contract. In management-oriented contracts, all the financing risk is taken by the WSB. In concession-oriented contracts, most of the financing risks are taken by the operator who invests his own funds. In lease contracts the risk is shared between WSB and operator.
Construction risk	Operator / WSB	Operator should be involved as far as possible in quality control during construction, e.g. Colombia, cf. case study WSP, 2001, Antioquia.

6. Autonomy and accountability

The legal status of the Water Board and the fact that it manages its own “extension and replacement fund” together with the service provider allows water revenues to be ring-fenced, and reinvested to improve the service delivery. However, investment plans may be subject to local authority approval.

As with WUAs, one of the strengths of the Water Board is that it is composed of and directly accountable to users. In practice, how effective this is will depend on strong leadership/vision from the chairman, and the organization of public meetings and other forms of communication through which the legitimacy of the Water Board is built. The private operator’s activities are overseen by the Board on behalf of the users. This may be a weakness when the town is very small (say less than 10,000 inhabitants), if it is difficult to find enough motivated and qualified people to carry out this oversight in a professional manner.

Transparency is particularly important when:

- Conducting the bidding process, evaluation and award of the contract. A lack of transparency in this matter can lead to frustration and lack of confidence from users. Intensive sensitization is needed during this stage.
- Setting and updating tariffs. The financial situation should be presented and discussed by users’ representatives. Tariffs should be the result of fair negotiations between the Water Board (which aims to defend users’ interests, while being fair to the operator) and the private operator (aiming to cover its expenses, make a reasonable profit and be as cost-effective as possible).

7. Regulation

The two main regulatory mechanisms are through the contract and by a professional regulator. Regulation through the contract is only possible when the Water Board and/or local authority have access to professional advice. To be cost effective, a professional regulator must operate in several towns, and even dozens of small towns, for example a whole district – or *département* in French speaking countries. During the last 10 years, new entities have been specializing in the regulation of small-town water service in such countries as Mali (CCAEP¹²), France (Service Public 2000) and Canada. These organizations provide support to local communities or authorities and to the service providers themselves, through activities such as financial audits, (re)negotiating contracts to meet their needs, supervising the contract, and providing advice on service quality indicators and the financial situation of the business. Experience suggests that it is best not to oversize the regulating body, by asking it to provide too many complex functions, as it then becomes very difficult to finance, making it unsustainable.

8. Competition

¹² Since 2000, the new name for CCAEP (Cellule de Conseil aux Adductions d'Eau Potable in French) is GCS-AEP (Groupe de Conseil et de Suivi des Adductions d'Eau Potable).

Competition between operators is one of the main ingredients for success of a management model built around the principle of delegation. For water supply in a small town, this competition is most apparent during the bidding process. It is in the Water Board's interest to bring several operators into competition. There are situations where the "local" candidate has been favored but this is not a general rule. For example, in Mauritania more than 90 % of the operators come from the town where they manage the water service, whereas, in Uganda, under the Small Town Water and Sanitation Project, most of the operators selected did not originate from the town where they operated, and in some cases towns were packaged for bidding purposes. Competition encourages the winner of the tender to improve his proposal, for example by lowering tariffs or increasing his investments.

It is not easy to maintain a good level of competition between operators inside a small town, because the management contract generally covers the whole town. The Water Board may find it beneficial to limit the extent of the monopoly, by authorizing other operators to provide ancillary services (from private boreholes, from trucks or carts) to customers not served by the network. From a national point of view, operators' performance may also be strongly encouraged if the regulatory body is able to compare service quality indicators (a good example is provided by the *Superintendencia dos Servicios Públicos* in Colombia) and make them public by publishing these indicators on an annual basis (through newspapers or others media).

9. Financing

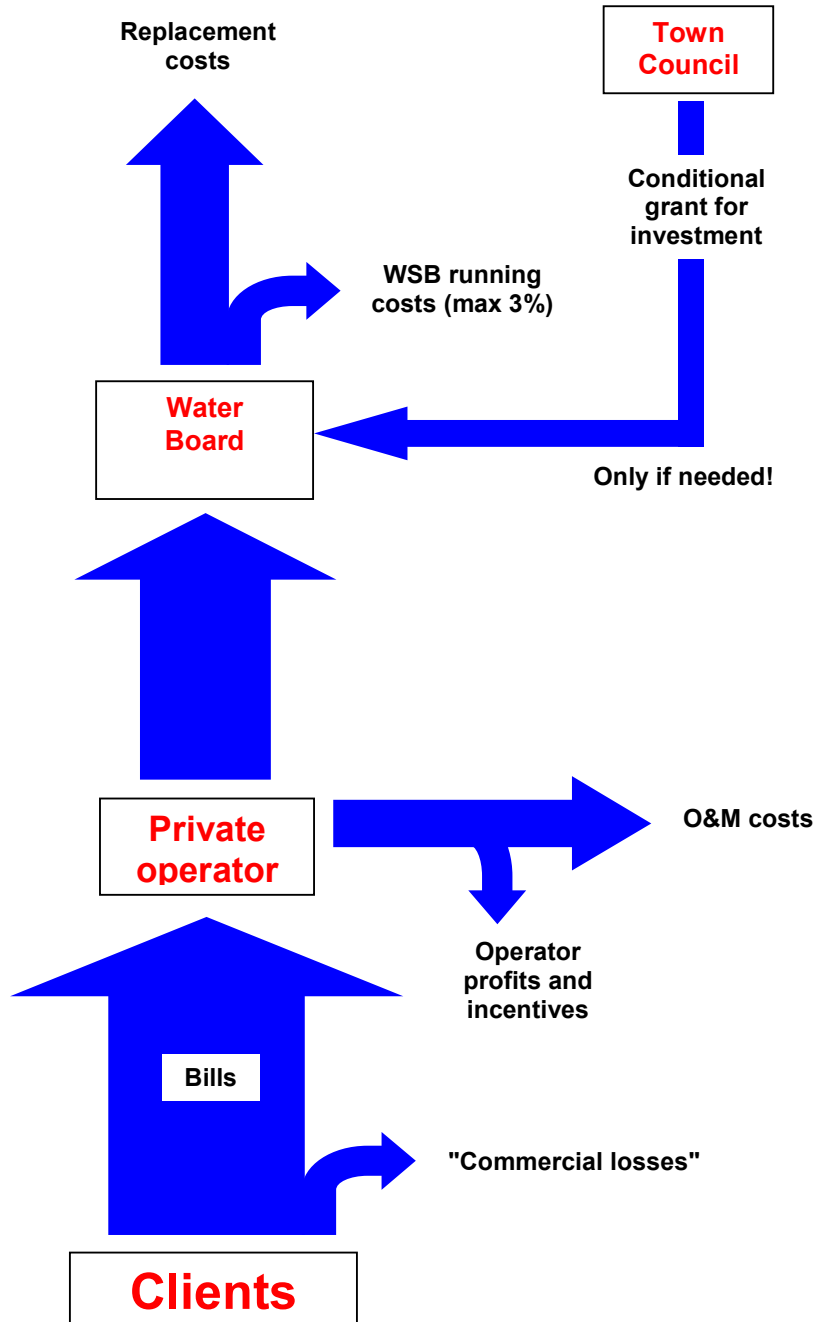
For an overview of cash flows, see Figure 1.

Guiding principles for financing the Water Board model include:

- For capital costs, model still relies on public investment, especially for major works such as boreholes, storage facilities, dams, and main pipes. In most countries, a large part of this investment is still carried by central government. Depending on the size of the town, the state of existing facilities and the capacity of constructors/operators, investment by the private constructors/operators and/or the users is typically in the range of 10-30% of the investment needed.
- As far as possible, the private operator should be free to manage and invest money where it deems it would be most useful. This is a lease/concession contract feature.
- Financial management needs to be transparent. In Uganda, for example, the Water and Sanitation Board (WSB) opens two bank accounts: one for its own operating costs and another one for the replacement of assets and facilities. This last is fed by the private operator but managed jointly by the WSB and the operator – no money can be withdrawn without the two signatures.
- The "replacement account" is fed with some kind of "replacement fee" by the private operator. The amount of this fee depends on the size of the town, the autonomy/responsibility of the operator to invest, the type of technical equipment, etc. The fee could be a percentage of revenue collected, but it is recommended to fix a minimum monthly amount to be paid by the operator.
- The Water Board overheads (that is, its staff costs) should be capped – for example in Uganda it is fixed at 3 % of revenue collected. The Board should also be required to call for tenders to purchase goods or services, though for works on the system it may have an agreement with the private operator, with a list of rates for pipe replacement, installation of a new house connection or a new standpost,

etc.

Figure 2: Financial flows associated with the Water Board model



- In some countries (e.g. Ghana), contractual arrangements include the payment of a sanitation fee, to be used to promote on-site sanitation by providing technical advice at household level and/or co-funding the construction of facilities (pit latrines, etc.)

10. Limitations

The Water Board model is most common in towns where there is an established public administration (not necessarily based at town level) and where the local authority invests ownership and oversight responsibilities in the Water Board through bye-laws or a performance contract. The size of town is likely to be greater than 10,000 and may be up to 100,000. Alternatively, the model may evolve from a community-based WUA model at village level.

A potential weakness of the model lies in its reliance on semi-voluntary Board membership, and its need to seek approval from local authorities in activities such as setting tariffs and investment plans. As the town expands in size and complexity the need to address these issues, and the need will become more acute for qualified professionals on the Water Board to guide the business and to manage the contract with the operator. As more formal structures are put in place, the need to regulate activities and to ensure accountability to users requires greater attention.

11. Summary analysis

Table B3.1: Analysis of WSB model against key ingredients for success

Ingredient for success	Rating	Reasons
Financial and management autonomy	4	The WB model ring-fences water revenues, and has relative autonomy in setting tariffs and investment plans (but may need approval from the local authority). Depending on the contract, the operator is able to invest and improve/extend the service under arms length contractual obligations and incentives.
Demand responsiveness (including service to low-income households)	4	Responsiveness is always stronger where a local private operator is involved. Nevertheless, the WB is structured to ensure that the needs of low-income users are met.
Professional support	4	Trying to access professional support is more critical for the WB (in terms of e.g. business plans, performance indicators...) rather than for the operator, who is selected to provide technical skills. But where the WB includes professionals (e.g. District Engineer) there will be recognition of the need for professional support.
Incentives for expansion	3	This depends on the contract design. Incentives can be high in the case of a lease contract. Incentives should be focused on private connections to grow the business.
Competition	2	Competition is only possible at the time of contract bidding. There is hardly any competition where the operator is already "in the business".

Table B3.2: Key stakeholder roles and responsibilities

Local Authority or Government	<ul style="list-style-type: none"> • Owns the assets but vests ownership and oversight in the Water Board (WB). • Signs a performance contract with the WB, defining roles and responsibilities, as well as objectives in terms of cost recovery, service improvement, system extension and/or replacement, coverage, etc. • Oversees the quality of service provision, by monitoring the performance contract and reporting back to central government (in most cases an annual report would be enough). • Approves tariffs and investment plans.
Water Board	<ul style="list-style-type: none"> • Signs a "performance contract" with the local authority. • Manages the facilities in the name of the local authority, and is accountable to the local authority for maintaining the assets. • Signs and monitors a contract with a private operator. • Contracts staff to support the WB's executive functions. • Sets tariffs, after negotiation with the operator and the local authority, according to guidelines issued by central government. • Sets business plans (including investment and financial plans), using reports provided by the operator. • Remains accountable to the user community.
Private Operator	<ul style="list-style-type: none"> • Signs a contract with the WB. • <i>Management contract</i>: the private operator is in charge of day-to-day management and operations, maintenance and small repairs (a cost ceiling must be set, depending on the contract obligations, the size of the town and the technical characteristics of the equipment), and all commercial functions (billing and collections, etc.) • <i>Lease contract</i>: the private operator can invest and recover his investment through the sale of water – this point needs to be discussed at town level, taking into consideration the condition of the facilities (i.e. the needs for replacement/extension) and users' ability to pay. • In either case, the operator will be paid on the basis of performance.
Central Government	<ul style="list-style-type: none"> • Defines and signs a MoU with the Local Authority, clarifying the objectives in terms of service improvement, as well as the indicators for its monitoring. • Provides support and arbitration. • Endorses performance contracts between the local authority and the Water Boards. • Is responsible for design of the institutional framework, in line with existing Laws/Acts and the National Water Policy. • Works in coordination with other Ministries when necessary (for example, the Ministry of Health for the sanitation and water quality aspects, the Ministry of Local Government for legal issues about ownership and procurement).

REFERENCES

Recommended case studies and literature

Niger – Posters and case studies presented during the Addis Ababa conference (2002)

Tanzania – Posters and case studies presented during the Addis Ababa conference (2002)

Uganda – Posters presented during the Addis Ababa international conference (2002)

Tanzania – Feasibility study: small towns water and sanitation program (Hydroconseil for the French Agency for Development and the Ministry of Water, 2002)

Uganda – Small towns water and sanitation services – A case study (Bill Wandera, Aquaconsult for the Water and Sanitation Program, 2001)

Niger – Additional studies carried out in the framework of the PSE (Programme Sectoriel Eau, IDA-funded) (Hydroconseil, 2001, 2002)

WSP / World Bank, Summary report of the e-conference on small towns WSS, March 2000

Examples of bye-laws, contracts, rules of association...

See separate files and paper copies

Niger – Contrat de délégation entre une association d’usagers et un opérateur privé (version validée lors de l’atelier national de Maradi, août 2002)

Ouganda – Documents mis au point par DWD pour la délégation des services dans les petites villes (en particulier les documents d’appel d’offres)

Uganda – Performance contract between the Minister of Water, Lands and Environment and the Town Water Supply and Sewerage Authority

Ghana – Bye-Laws and Management Contract for Water Boards in Enchi and Wassa Akropong, Ghana (CWSA/PPIAF pilot project, February 2003).

**Town Water Supply
and Sanitation Services
Volume 3**

Companion Paper B4

**Private Sector Water Entrepreneurs and
Companies**

**Stephen Myers
March 2003**

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Private Sector Water Entrepreneurs and Companies

Stephen Myers

March 2003

1. Introduction, Historical Context & Forms of Private Service

There is a tendency to consider the significant involvement of the private sector in the supply of water for urban use as a recent development. This is because, with a few notable exceptions, for much of the 20th century, water services have been provided and operated by the public sector. However, the private supply and sale of water has been practiced for thousands of years – and not just on a small scale.

In considering the present and future involvement of the private sector in the water service industry in developing countries, guidance can be obtained from the experiences of the developed countries. The present European manufacturing and service-based economies developed from predominantly agricultural economies over a long period – for some the process having begun some 300 years ago. Then, as now, the earlier stages of industrialization were characterized by a massive movement of population from rural to urban areas, which rapidly became densely-populated leading to difficult, often unsanitary, living conditions. The effects of this major social change had not been sufficiently predicted or appreciated and happened too rapidly to plan a structured development of basic services such as water supply. In these circumstances, it was frequently the private sector that responded to the water supply and sanitation needs of the rapidly growing towns and cities.

It is interesting to consider the situation of London and the involvement of the private sector in the development of its water services from 1580 to the present day. For 335 of the last 420 years, London's water has been supplied by private companies, no public utility having been involved. Only for 85 years of the 20th century was the city's water service managed by public bodies, to be re-privatized in 1989. From 1580 to the mid-1800s, England can be considered to have been a developing country in modern parlance.

This report has as its subject those private individuals and companies that are providing a water service to the community in developing countries and that began their operations as a result of a privately-generated initiative rather than in response to opportunities generated by a public body. In this sense, these entrepreneurs – from the smallest to the largest – have perceived a market for the supply of water for domestic and commercial use and have responded to it in ways that vary according to local socio-economic circumstances and the physical conditions of the basic resource and supply.

Our discussion is limited to those private individuals, families and groups that have taken responsibility for financing their own operations and the assets on which they are based, without resorting to general stock exchange flotation. In this sense, the report does not include public limited companies quoted on stock exchanges or companies that contract with a public entity to provide all or part of a water service, whatever form of PSP this might take.

In the discussions that follow, we consider three categories of entrepreneurs and companies operating in developing countries:

- Water Vendors
- Unregulated Private Water Companies
- Regulated Private Water Companies

The distinction between regulated and unregulated water providers in developing countries is an important one. Unregulated water providers - particularly investors in small-scale piped supplies of varying quality and extent - are an extremely important group, but also the most vulnerable. Recent work has exposed their true importance to developing economies. The large international water companies can only justify investment in foreign countries where their networks will serve large populations – normally more than 300,000. The small, national water providers represent a local, private capability that can, under the right circumstances, grow to eventually take on water service responsibilities for whole towns and beyond. In the absence of official recognition and acceptance, they operate in constant fear of prosecution and expropriation. Acceptance and regulation recognizes their investment, protects them from unfair competition and provides them with the security to invest well, secure in their longer-term future. This also acts to the benefit of the customer base and society and the economy overall.

Therefore, one of the greatest current challenges facing governments and the international agencies is how to recognize and encourage the entrepreneurial capability of local business in water service provision. The approach needs to include “gentle” regulation, i.e. sufficient to ensure that assets are constructed for the longer term and water quality safeguarded but not so heavy that it stifles small-scale private initiative. If an acceptable regulatory compromise can be reached, rapid progress could be made to meet targets for worldwide access to piped water. The sector would benefit from a work which clearly sets out the principles of regulation to form the basis for ensuring that a water service – whether private or public – is operated to an acceptable level of accountability and transparency. Such a work should set out the minimum regulatory requirements and the simplest regulatory structure needed to monitor and check compliance, as well as the benefits that could stem from the further introduction of each element of regulatory complexity.

2. Water Vendors

This category includes individuals with handcarts, kiosk operators and tanker owners. In towns or neighborhoods without piped water systems, or with unreliable ones, there are golden opportunities for water vendors. Even when the price charged for each cubic meter of water is many times the cost of nearby pipe supplies, there are customers for whom the vendor is the only option. Customers are either unable to transport water for their family needs, or value the time saved more than the cost paid to the vendor.

It is most unusual for water vendors to have any legal basis for their operations, though tanker owners and official kiosks for vending water do normally operate as part of a registered company. Most water vending operations have no need of formal ownership arrangements, being “owned” and operated by individuals or at most by a single family.

Some water tanker operations may be large enough that a company through which the tankers are owned and operated will have two or more individuals or families owning the equity. The limited finance required is, in the main, provided either from their own resources or those of close and extended family. On occasion, funding might be provided by an individual who plays no part in the operation, but this is extremely unusual. Only when a tanker operator, or an investor wishing to install and operate multiple kiosks, has a secure contract with the authorities to provide a water service will it be possible for them to approach banks for loans. Resort to the official banking system for loans is, however, uncommon for a number of commercial reasons and it is more likely that such entrepreneurs will resort to less official sources of lending should they need them. Most owner-operators will only employ themselves or their families and only those operating a fleet of tankers will have need of staff that are not drawn from their extended family environment.

Water vendors are totally autonomous and, in the main, are accountable only to themselves. There is a limited kind of accountability for the tanker or kiosk operators when, as companies, they are:

- required to submit audited accounts to the tax authorities;
- operating on funds borrowed from other individuals or banks, when they may need to account for their activities; or
- dependent on third parties for the source of the water that they sell or re-sell, in which case they will have to maintain records of water purchased and, depending on the terms of their arrangement with their supplier, the price at which they have sold it on.

For the most part, the activities of water vendors are unsupervised. When the operation has to be licensed, or otherwise obtain the approval of an official third party to operate, some supervision might be practiced. However, given the multitude of vendors serving customers in widely differing circumstances, effective supervision is extremely rare. Some element of regulation may be imposed through licensing of tanker operations and fixed kiosks selling on water purchased from a public water utility. This may take the form of maximum charges to be levied, but is unlikely to extend to quality of service provided, even when regulation sets out quality and performance targets.

Competition for business among water vendors is almost certainly the fiercest found in water service provision. The low investment in “assets” needed and their inherent mobility forms the basis of this competition. It is not unusual for competition to degenerate into “turf wars” resulting in survival of the fittest (or the best connected to protective forces). It is only when investment in assets becomes significant, like the purchase of one or more tankers, that there are attempts to apportion territory either by private treaty or through trade associations. In the absence of regulation, monopolistic hold over an area severely cuts back competition. However, in the dog-eats-dog environment of water vending, competitive forces can never be completely defeated and abuse of a monopoly position by poor service or extortionate prices will encourage the entry of another to break that monopoly.

Individual water vendors, and family concerns, do not perceive themselves as needing professional support. If a water vendor is ambitious beyond the business that they can individually undertake, they may seek advice as to how they might create a larger

concern. However, in practice, they learn on the job and could not afford professional support were they to need it.

There are some countries where vendors, particularly tanker owner-operators and kiosk owners, have formed themselves into commercial associations. Clearly, these can act as forums for debate of operating conditions and therefore for centers of learning from the experience of others. However, normally, they are formed for fixing and negotiating charges and for resolving territorial disputes.

3. Unregulated Private Water Companies

The supply of water through a network of pipes is a commercial activity with a relatively high public profile. Being a “visible” commercial activity, most water suppliers will establish a registered company in accordance with national law and custom and operate their supply business through this company, even though their business activities are neither regulated by the authorities nor, in most cases, substantial.

Unregulated water companies, being small-scale operations, are generally owner-managed and operated, under similar conditions to those described for water tanker companies. Ownership is also similar – by individuals or, for the larger companies, groups of individuals or families. Due to the precarious nature of the tenure that investors in water infrastructure have in an unregulated environment, banks will only consider loans on a short term basis and at higher interest rates than charged to businesses based on less risk. Most initiatives will be funded out of personal funds, and such loans as may be sought will be guaranteed using personal assets. In this atmosphere, the investor seeks to recoup much of the initial investment upfront through the connection charge. However, this may prove a brake on the acquisition of custom and the water company may need to offer easier payment terms to attract connection to their system.

By definition, this category of water service provider operates in an unregulated environment. Although this has some negative results in respect to the suitability of systems provided for the longer-term, from both economic and physical infrastructure viewpoints, there are also positive aspects. Provision of a water service by the private sector in absence of regulation is not, therefore, all bad. The challenge is to accept and encourage private initiative and devise an appropriate regulatory system that avoids the negative aspects of an unregulated water service without stifling initiative and losing other positive aspects.

The operations are, in effect, supervised by the customers of the company. The relationship between company owner and customer is a direct personal one and the customer can impose sanctions for inadequacies in service by withholding all or part of payment due. This accountability is only real however in respect to the quality of service provided; there is no financial accountability.

When a water company’s source of water is derived from a public water company and sold on, the public company may well control the price at which the water is sold by the private company. Rarely, they might also impose a restricted range of minimum levels of service to be provided. However, the service levels provided by the private companies are often better than those of the public company, due in no small part to the close company-customer relationship.

Most unregulated water companies are too small to be able to accept the expense involved in obtaining professional support. However, a number of the owner-operators appear to have construction or engineering maintenance as their basic experience and some have either themselves passed through tertiary education in technical subjects or involved family members who have.

In Paraguay, the “aguateros” (see below) have formed a trade association, CAPA. This serves to represent the commercial interests of the sector as a whole rather than as a means of obtaining professional support. At a conference in 1999 for independent providers of water, held in Cartagena, Colombia, the 29 companies represented expressed the view that they would welcome official recognition of their activities and regulation, as this would give them the security to invest in the future of their operations, including investment in professional support.

Theoretically, there is a big potential for competition between providers of a piped water supply in an unregulated environment; in practice, it rarely happens. The investment in fixed assets is considerable compared with the magnitude and rapidity of the return that can be generated on the investment. In addition, most of the assets, particularly storage, underground distribution pipes and connections to properties can be used for no other purpose than that for which they were installed. So, except for some spirited competition between suppliers at their common boundaries, an entrepreneur who first develops the system to provide water to an area and who has already attracted customers has a considerable advantage over any prospective competitor.

This situation is well exemplified by the “aguateros” in Paraguay, who install systems in advance of development or when development of an area is in its earliest stages. By investing speculatively, in effect, they stake their claim to water service provision to the area and they cut back the risk of effective competition.

Lack of effective competition in an unregulated environment has too many negative aspects to be tolerated:

- the boundaries of an area considered of commercial interest to a private investor do not necessarily coincide with the natural boundaries of a supply area, e.g. they may well exclude areas of development with a low potential to pay for the water service;
- areas will be “cherry-picked” by the private investor (they would be commercially naïve not to) and this makes it all the more likely that a service to remaining areas will suffer progressively greater delays;
- even if the investor were to wish to do otherwise, there are few incentives for ensuring that infrastructure installed will be suitable for the longer term – due to uncertainties of tenure inherent in an unregulated situation – and experience shows that it is far more effective to invest in water systems for the long term (due both to the high cost of initial investment and the high cost of maintaining systems constructed from inferior materials);
- similarly, there are few incentives to ensure that the quality of service provided is any higher than the level demanded at the time of investment, and it may be costly to raise standards as aspirations of customers rise;

- due to the “short-termism” that pervades this type of environment, a system installed by the investor, which may have appeared to be so beneficial at the outset, may limit potential to improve health and the economy of an area once demand is limited by its capacity.

4 Regulated Private Water Companies

Regulated water companies are normally established and operated in accordance with national corporate law and custom. In the context of this paper, the legal forms most commonly employed are privately-owned, limited liability companies and co-operatives.

Private water companies in regulated situations in developing countries potentially have access to more financing routes than do public institutions – the latter sometimes having to work with constraints on access to funding from abroad and the private capital markets, which may completely deny them access. In an adequately regulated situation, there is no reason why private water companies should not have access to all normal routes for financing business ventures plus others available to socially-desirable developments in developing countries from the outset of their activities:

- commercial banks;
- sources of venture capital;
- government loans;
- funds from international lending agencies specializing in fostering development in the developing countries and improving the lot of the poor;
- subsidies frequently made available to public sector water utilities – to promote service extensions to areas that otherwise might not be served - should not similarly be made available to private sector companies; this should, of course, exclude any subsidies made to public sector water service organizations that have been made to compensate for inadequacies in the efficiency or effectiveness of their operations.

In financing water services, funding institutions and venture capitalists are normally willing to lend between two and four times the equity capital deposited by the shareholders in the venture. Procedures for approving lending to private sector water companies act as a secondary form of regulation on them as lenders wish to assure themselves of the financial viability of the venture applying for a loan. The technical and financial audits involved in the due diligence activities carried out by lending institutions can therefore provide a “comfort factor” to the public authorities entrusting responsibility for providing a water service over the long term to a private company.

As private sector involvement in a country becomes established and is shown to be a stable and profitable business environment, there will every prospect that the general investing public will be interested in having access to the equity of private water companies. This opens up another source of finance when private water companies offer a all or part of the equity for sale on the local stock exchange or seek to raise additional equity through a public offer.

Ownership of private limited liability water companies does not differ much from those of unregulated companies. It is generally in the hands of individuals or groups of individuals or families. However, as they grow and establish themselves as entities with a

stable income and profitability, they may be perceived as good investment opportunities by sources of venture capital and banks, pension and insurance companies that may be interested to invest in the equity of the company.

Ownership of cooperatives is spread among the members of the organization. In Bolivia, for example, those who commission a connection to the system and pay the charges for that connection, are automatically members. The extent of their ownership is limited to the capital sum that they pay, as a lump sum or by installments, for connection. As a member, they have the right to vote in management decisions, though in practice, it is normally exercised through a representative elected to the Board of Management.

Depending on the size of the water company, the extent of the area served and numbers of connections to its system, it will either manage and staff it with extended family members or employ personnel if demand exceeds the capability of their family resources. Cooperatives always have to establish a company structure staffed by employees most, if not all, of whom will have no family relationship to members.

Regulated private water companies in developing countries tend to be larger than their unregulated counterparts and therefore better able to invest in professional support. However, they are most likely to make the investment in training their own staff rather than buying in expertise. Generally, they consider that expertise bought in from third parties is going to cost more than attempting to improve their own capabilities. It is often difficult to convince companies that the use of external professional support can be more cost-effective in the long run – by avoiding the cost of funding the learning curve and mistakes made in gaining experience.

Regulated water companies rarely associate with other more experienced companies, particularly those from the developed countries, mainly on grounds of the cost involved. Cooperatives are more open-minded towards obtaining professional support for some of their specialist activities and are more likely to buy in expertise than those owned by a few individuals. The larger the private water company, the more likely they are to recognize the benefit of out-sourcing specialist activities.

Private water companies are fully autonomous in respect of their management and operations. Their Boards are composed either solely of members drawn from the principal shareholders or are partly by Directors selected by the shareholders.

Cooperatives do not necessarily have the same degree of autonomy. Cooperative law often requires that at least a portion of the Directors on the Board of Management will be external appointees placed there by the public authorities to protect the interests of the members of the cooperative from undue control by internal lobbies and groupings. These appointees may have political, financial or legal backgrounds and will not only be capable of providing informed advice but can also act as a brake on what might otherwise be a Board that could pursue policies dictated by vested interest.

The entity or entities responsible for supervising the operations of regulated private water companies and cooperatives will depend upon which public sector organization has contracted with them to undertake the service or granted them the license to operate. This may be at national, regional or municipal level, or responsibility may be delegated by one of these to a third party. In practice, most local governments of small towns do not have

the trained staff to supervise the private water companies and supervision, if any outside of the regulatory process, is provided from regional or national level.

Most countries that accept and encourage private sector involvement in water service provision, introduce some form of regulation. It appears to be less onerous for government to introduce regulation of private sector water companies than to impose it on public sector service providers. Indeed, one of the perceived benefits of delegating this service to the private sector is the separation of service regulation from service provision and attributing responsibility for them to the public and private sectors respectively. This said, however, there are, as yet, few countries that can be considered to have introduced a regulatory regime for their water sector which is then effectively put into practice. It requires considerable commitment to achieve adequate regulation and most countries, although with stated good intentions, have not yet made this commitment.

The degree to which private water companies are accountable depends to a great extent on the nature of regulatory requirements and the effectiveness of the regulatory bodies to monitor their performance and to apply sanctions for non-compliance. Private water companies not subject to the requirements of a stock exchange have no obligation to publish their accounts or performance unless required to do so by the conditions of their operating licenses or the regulatory system to which they are subject. The opening of books to the regulatory authorities in order to periodically adjust water charges may not necessarily mean that financial data will be published and be available to the general public. Transparency is generally acknowledged to be desirable where water service providers are concerned but private companies are reluctant to voluntarily publish financial and other operating data, beyond that which they are legally required to make available.

In contrast, the very nature of ownership of cooperatives ensures accountability to shareholders – its customer base – and this accountability is underwritten by the Board members that are independent of either the management or the members. However, the extent to which operating data will be more widely published depends to a great extent on the openness of the Board and, failing this, regulatory requirements – as for the private water companies. In general, cooperatives appear to be quite willing to publish their Annual Report and Accounts and, to this extent, may be considered generally more accountable than privately-owned water companies.

It is difficult to avoid monopolistic situations in water service provision. Many attempts have been made to break this natural monopoly – but most have been unsuccessful. Competition within a monopolistic situation has to be artificially created and, under these circumstances, regulation is extremely important. Companies can be made to compete for the rights to operate in a monopolistic environment but the rules of that competition need to be clearly set out.

The benefit of regulation, for a developing country which uses – or intends to involve – the private sector in development of its water service, is that it establishes a level playing field for those involved. The negative aspects of an unregulated environment, particularly the “short-termism” which drastically reduces the benefits of private initiatives are avoided through regulation by:

- officially acknowledging and defining the rights of the private sector in water service provision, particularly in respect to length of tenure;
- defining the minimum acceptable standards for water service assets;
- establishing minimum service levels;
- setting out the procedures and factors to be taken into consideration when establishing and reviewing charges.

Regulatory provisions can either be used as the basis for competition between companies wishing to provide a water service to an area or it can be used to generate comparative competition between companies which effectively have a monopoly in their respective areas of supply.

5 Limitations and Replicability

The principal limitation of water vending is the relatively small number of households and volumes of water that can be supplied. A recent study has estimated that an individual vendor with a push-cart can reach between 100 and 200 people and a tanker can serve between 70 and 100 households a day. Households served in this way are likely to have access to between 5 and 15 liters per person, well below the minimum considered adequate for reasonable hygiene. A further limitation is on quality of potable water provided in a totally unsupervised environment. Lack of access to finance for all but the contracted and licensed outlets will generally preclude the expansion of vendors' activities into providers of piped supplies. The outcome is that water vendors can rarely compete and survive against an effective piped supply. So, while the activity of water vending is widely replicable and will continue to be a necessary option for the un-served poor in areas with limited institutional capacity, it is likely to be progressively phased out by commercial pressures as an effective piped supply of water extends to cover an area.

Limitations on unregulated private water service providers arise from the insecurity of their tenure and the ever-present risk of expropriation of their infrastructure assets. This generates the "short-termist" approach to their business, reduces the quality of the service they might otherwise provide and limits their access to legitimate sources of finance. The result is that the extent of the supply areas are normally limited to between 500 and 2,000 connections, the average for an "aguateros" system in Asuncion, Paraguay being 1,000 connections. One experienced "aguateros" has observed that it is a more prudent business policy to restrict the size of an area served to 1,000 connections for water and to expand by diversification into other services within that area than to seek to extend the area and numbers of connections served with water.

In the past, private water companies have supplied large areas with tens of thousands of connections. Although this was achieved in the absence of regulation, or very little regulation, their rights to serve the area were enshrined in law, providing security of tenure.

Once a country's government has accepted the concept of private sector involvement in water service provision – and established an appropriate regulatory system - there is no reason why private water companies deriving their origins locally should not be able to make a substantial contribution to the water services of a country. Limitations on the development of a local capability under these circumstances relate to the willingness of commercial institutions to fund the operations of companies with unproven track records

or only restricted experience. However, it is in the long-term interest of the country and its citizens that development of a local capability be both encouraged and fostered.

An embryo private sector is unlikely to have the capability to undertake the largest projects. The large international water companies are only interested in contracting to invest in large centers of population and service provision in medium to small-sized towns will be left to local companies to develop. However, by the end of the first period of tenure of the international companies, it will be advantageous to most countries to have a home-grown capability to compete for the next period of tenure – even in the largest cities.

Private provision of water services will occur spontaneously in developing countries, wherever there are entrepreneurs who spot a commercial opportunity. But, the practice of providing a water distribution system purely on grounds of commercial attractiveness in an unregulated environment has too many negative aspects to be an approach that should be encouraged. Once a government has accepted the concept of private sector involvement in water services, particularly its national private sector, it should encourage its replicability through legislation and by establishing an appropriate system of regulation. The spontaneous initiatives taken by businessmen in a number of developing countries – e.g. Paraguay, Argentina, Bolivia, Colombia, Vietnam and Cambodia – are eminently replicable but they need to be formalized into a regulated environment, formed with sensitivity to the need to foster, and not stifle, private initiative.

12. Key Ingredients for Success

The key ingredients for success are analyzed in a rating system for water vendors and each of the two private water service situations in Table B4.3.

From this table, the ratings of the various forms of water service provided by water vendors and private water companies, maximum rating being 5, can be summarized as:

Type of Private Water Service	Rating	Comment
Water vendors	2	Essential but uncontrolled service
Unregulated private companies	2	Rating severely limited by unofficial nature and fear of expropriation
Regulated private companies	3 - 4	Regulation improves situation but imperfectly due to variable quality of regulation and implementation

Table B4.1 Forms of Private Water Service - Literature Sources and Country Examples

Forms of Private Service	Literature References (below)	Country Examples in Literature Search
Water Vendors	1(a) to (g)	All forms of water vendor – individual water carriers, hand-drawn & animal-drawn water carts, motorized water tankers & fixed points-of-sale - are found throughout Africa & in many parts of Asia. Carts and tankers, particularly the latter, are used in some parts of the former Soviet Union and in Latin America and the Caribbean
Unregulated Private Companies	3(h & i) 3(k) to (o) 3(p)	Americas - Colombia; Honduras; Peru Asia - Cambodia; Vietnam Africa - Benin; Burkina Faso; Guinea; Ivory Coast; Mali; Senegal
Regulated Private Companies	3(a) to (g); (i) 3(q) to (s)	Americas - Argentina; Bolivia; Guatemala; Paraguay; Africa - Mauritania; Uganda

Table B4.2 Risk Analysis and Mitigation

Type of Risk	Water Vendors		Unregulated Private Companies		Regulated Private Companies	
	Risk Allocation	Risk Mitigation	Risk Allocation	Risk Mitigation	Risk Allocation	Risk Mitigation
Raw water quantity	Customer	Change vendor	Customer	Withdraw custom	Government	By contract
Raw water quality	Customer	Change vendor	Customer	Withdraw custom	Government	By contract
Effluent quality	Not applicable	Not applicable	Private Water Co.	None possible	Private Water Co.	By law or contract
Land rights	Not applicable	Not applicable	Private Water Co.	None possible	Private Water Co.	By law
Tariff regulation risk	Customer	Change vendor	Customer	Withdraw custom	Private Water Co.	By bid & contract or regulation
Collection risk	Vendor	Withdraw service	Private Water Co.	Withdraw service	Private Water Co.	Experience & possibly sanctions
Operating cost level	Vendor	Withdraw service	Private Water Co.	Management experience	Private Water Co.	Management experience
Financing risk	Not applicable	Not applicable	Private Water Co.	Management experience	Private Water Co.	Management experience
Construction risk	Not applicable	Not applicable	Private Water Co.	Management experience	Private Water Co.	Management experience

Table B4.3 Ingredients for Success

Ingredient for Success	Water Vendors		Unregulated Private Companies		Regulated Private Companies	
	Rating	Comment	Rating	Comment	Rating	Comment
Financial & management autonomy	5	Owner-operators	5	Owner-operators	5	Owner-operators
Competition	3	Depends on alternatives available to customer	2	High asset cost precludes much competition	3	Award by private treaty possible; bid basis or private treaty may not be transparent
Demand responsiveness (inc low income)	5	Tendency to be flexible towards low-income custom	5	Responding to opportunities & flexible to low income custom	4	Obligations established by contract or regulation
Expansion incentives	1	Limited by personal resources	1	Expropriation risk	4	Obligations established by contract or regulation
Professional support	1	Tanker trade associations	1	Trade association assistance	5	Commercial pressures; employ trained staff or train; outsource specialist activities
Regulation	0	Not applicable	0	Not applicable	3	Not usually adequate
Transparency, accountability	0		0	Accountable to tax authorities	2	Not usually as much as desirable
Summary rating	2	Essential but uncontrolled service	2	Rating severely limited by unofficial nature	3 - 4	Regulation improves situation but imperfectly

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**Town Water Supply
and Sanitation Services
Volume 3**

**Regional and National Utilities – The
Scottish Model**

Companion Paper B5

**Barry Walton & Colin Schoon
March 2003**

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Companion Paper B5: Regional and National Utilities – The Scottish Model

Barry Walton and Colin Schoon

March 2003

1. Introduction

In general, regional and national water utilities in developing countries do not have a good track record in delivering reliable services to dispersed towns and villages. The driving force behind the creation of parastatal authorities is usually related to larger water resources issues, but their mandates often include the provision of local water services. National or parastatal organizations can come into their own in activities such as raw water capture, delivering multi-use large assets, financing, equalizing standards and targets, and monitoring and policing performance. However, in most countries, service delivery by wide-mandate organizations has fallen well short of promise. Fundamental to this is the clash between politically motivated offers to supply universal services at very low or no direct cost to consumers, and a failure to understand and provide the means to deliver. It may be that national political, social or economic stress, or institutional conditions have also limited the general rate of development. Examples can be drawn from Ghana (GWSC), South Africa (DWA), Sri Lanka (NWSDB), Pakistan (Karachi – KWSB), Jordan (WAJ), some Caribbean countries, Eastern Europe and countries of the former Soviet Union.

In the developed world there are several different models of regional and national authorities, public or private, that have successfully combined the overall management of water resources with local service delivery.

This paper looks at factors affecting the performance of regional and national utilities, focusing mainly on the comparatively recent Scottish model, which was specifically designed to meet current expectations of service within a framework of public provision. First, it is useful to consider some of the drivers that led to the initial formation of regional and national utilities and to their more recent changes in the neighboring UK countries of England and Wales.

Drivers of change	Responses in England and Wales
<ul style="list-style-type: none"> • Growth of towns; industrialization 	<ul style="list-style-type: none"> • From early 1800s, private water companies formed under Acts of Parliament, competition between these and municipalities
<ul style="list-style-type: none"> • Consolidation for major capital works implementation, pooling for best use of professional resources and economies of scale. 	<ul style="list-style-type: none"> • Reducing number of public and private service providers based mainly on municipal areas • 1950s – 1,000 providers → 1960s – 340 → 1973 – 50 → • 1973 – 10 Regional Water Authorities formed, inheriting sewerage responsibilities with municipalities as agents • 2001 - 21 providers covering all water and sewerage services
<ul style="list-style-type: none"> • Capital finance needs 	<ul style="list-style-type: none"> • 1989 - Major factor behind privatization, to fund asset replacement and quality improvements driven by EU Directives

Drivers of change	Responses in England and Wales
<ul style="list-style-type: none"> • Catchment management and resource allocation and protection 	<ul style="list-style-type: none"> • from 1963 – some control through Water Resources Act • from 1973 – Regional Water Authorities responsible for catchment management • from 1989 – catchment management devolved to new environmental regulator
<ul style="list-style-type: none"> • Performance and financial regulation 	<ul style="list-style-type: none"> • from 1989 – strong regulation by government agency (Ofwat) – “independent” but responsive to changes in government policy
<ul style="list-style-type: none"> • Improvements in service delivery and responsiveness to customers 	<ul style="list-style-type: none"> • Demanding targets in Licenses and imposed by regulator-driven business and management efficiencies - including devolution of degrees of autonomy to town/district units within private operating companies • Customer relations developed through regulation and provider town/district units
<ul style="list-style-type: none"> • Responsiveness to political and economic climate 	<ul style="list-style-type: none"> • Strong ownership and governance oversight by regulator and competition authorities, demanding financial performance targets and media concern with water services - response includes significant change of one private provider from equity corporate model to “not-for-profit” model¹

In Scotland, a public national provider entity, Scottish Water, has recently been created against the trend of nationally regulated, locally provided services. The route was adopted against a backdrop of public and political opinion that rejected the full privatization (divestiture) option adopted in England and Wales.

2. Legal basis

Scottish Water is a publicly owned body corporate serving some 5.5 million domestic and non-domestic customers with water supply and sewerage services throughout the country of Scotland. In 2002 it replaced three former regional authorities, which in turn had, in the 1990s, replaced municipal providers.

It is enabled to carry out activities within or outside Scotland that it considers 1) are not inconsistent with and/or 2) are necessary in connection with its core functions. It is required to have and make available to any person a “Customers Standards Code”, approved by the Regulator (the Commissioner) and by parliamentary Ministers. There is scope for confusion in the approval procedure. The Commissioner monitors compliance with the code and the code may be varied if appropriate. Scottish Water is also required to work to a consultation code approved by Ministers, with the purpose of involving customers, rather than only those who would claim to speak for them.

The Customers Standards Code sets out exactly what standards of service can be expected. They cover a range of areas that are important to customers, including:

- Arranging and keeping appointments
- Planning interruptions to water supply

¹ The not for profit model refers to the Welsh Water/Glas Cymru model. Glas is a company limited by guarantee and is less a not for profit company than a not for dividend company. It requires to deliver surpluses to satisfy lending covenants and deliver future benefits to customers after meeting its costs.

- Dealing with emergency interruptions to water supply
- Handling enquiries about bills
- Responding to written or telephone enquiries
- Flooding from sewers

Scottish Water may fix, demand and recover charges for its services, based on a published charge scheme that has first to be approved by the Commissioner and Ministers. Ministers may, by regulation, provide for Scottish Water charges to be reduced in certain circumstances and charges arising from third parties using its services may be capped.

3. Ownership, oversight and operations

Scottish Water owns general water supply and sewerage surface and infrastructure assets and attendant liabilities. These include assets transferred from the former regional authorities and the presumption of right to use relevant assets that may be a catch-all for quite messy historic ownership. For many new capital projects executed under Build-Operate-Transfer (BOT) arrangements, ownership remains with the BOT Group over the lives of very complex contracts, covenants and multi-party agreements.

Management oversight cascades down from Ministers to a Board of Members with a majority of non-executives over executives². The former are ministerial appointees and the latter are appointed from Scottish Water employees subject to ministers' approval. Appointments and removals are restrictive and introverted³. External oversight is provided by technical, service and economic regulators. With the purpose of issuing challenging efficiency targets, the Commissioner (Regulator) carries out benchmarking against the English and Welsh private limited companies (plcs) and other utilities. As illustrated by the following quotations from its enabling legislation, the utility has assumed a mandate to manage its operations as a modern customer-focused business:

- “.....Scottish Water, when exercising its functions, must have regard to the interests of every person who is a customer or potential customer of Scottish Water.....”
- “.....Scottish Water must, in exercising its functions, seek to ensure that its resources are used economically, efficiently and effectively.....”

Scottish Water is both an asset-owning and operational organization. In a traditional way it uses internal staff, outside advisors, consultants and contractors to develop and execute capital works, in addition to exploiting BOT opportunities – a more recent development. It would seem to be enabled to out-source functions such as billing, but might well face serious internal and external pressure not to do so.

² The essential difference is that the executives run the business on a day-to-day basis while the non-executives bring different but solid experience to test the executives on their plans and performance.

³ The legal structure with ministers being the representatives of the shareholder (Scotland) but approving staff appointment is much more intrusive than would be the case in a public company (although not a closed private one). The legal insistence on staff recruitment being from inside the organization makes the introduction of new talent difficult. It is a typical UK public sector requirement of advertising the post internally before seeking outside candidates.

Scottish Water has normal sector powers to set salaries, provide benefits and engage and dismiss staff. It has to recognize staff and labor representation through liaison committees and has a Board Member responsible for staff matters.

4. Professional support

In general, professional support is not a problem, there being widespread contact with peers in England, Wales, Europe and beyond. Information capture via the internet and personal access to specialists is more easily and cheaply achievable than even a few years ago. Access to consultants, sector provider staff and regulation specialists is available and has always been used to cross-fertilize, peak load work and for special projects⁴.

5. Risk analysis

A lofty State promise to deliver, coupled with not diverting resources into the activity, holding down charges, using the public provider as a social security agency and creating extravagant asset sets is not uncommon in the public sector in developing countries. That mix is less a matter of risk than one of courting failure. If a risk is taken consciously it is that customers will not react in an extreme fashion in the face of likely failure, but will somehow muddle through on their own.

A major risk for Scottish Water is that political interference and non-payment will mean that it cannot finance its activities; for customers, the risk is that Scottish Water will have an excuse by and large not available to English companies. There is no clear reward incentive to drive out cost and deliver services in the Scottish model and that is a critical difference compared with England and Wales.

Scotland does have a problem in reconciling delivery of enhanced services with increased charges to customers. However its recovery to billing performance remains in the 90% plus range.

The high-level risks inherent in the three models (common to developing countries, Scottish Water, and the England & Wales private model) are summarized in Table B5.1

Table B5.1: Comparison of risk in R/N Utilities

Model	Source of risk	Potential consequences
Public model (with characteristics most commonly found in developing countries)	Assumption of exclusive responsibility for all services without resources or will to deliver - in the expectation that the population will passively accept failure to deliver.	Extreme public reaction, unsatisfactory service delivery by the informal private sector, continuing economic and social damage in the population, poorly planned attempts to implementation alternatives.
Public model (as designed)	Political interference in	Reversion to a less

⁴ Peak lopping is the allocation of work to contractors and consultants when internal capacity is stretched. The diversity of work means that there is likely to be some use of external providers all the time but in different activities or aspect of the service. Examples include an intensive period of investment in new assets, carrying out a leak detection programme or setting up new simulation modelling of plant operation.

for Scotland)	budget and management, and limitations on ability to recover monies due. Potentially limited performance improvement resulting in tendency to blame the system.	autonomous public model, or possibly less transparent introduction of “back door privatization”.
Private model (as in England and Wales)	Failure to perform in face of intense regulatory pressure, or through business mismanagement.	Adverse and unmitigated public reaction leading to more “politically correct form of company”, and, in the extreme, reversion to predominately public model.

The specific risks facing regional and national utilities are outlined in Table B5.2, with comments on their nature and means of mitigation.

Table B5.2: Risk Analysis

Area of Risk	Type of risk	Risk Mitigation
Water Supply		
Raw water resources (quantity)	Long term resource recovery Peak demand/Limited resource Water rights	Storage and alternative sources Limit per capita allowance Limit system losses Agreements with other users
Raw water resources (quality)	Background pollution Point contamination Exotic quality limits	Control of land use Isolation of facilities Pragmatic standard application
Bulk transportation	Lack of capacity Mono-system loss of use	Double up systems Alternative power supplies Preventive maintenance Emergency plan for strategic asset
Treatment	Lack of capacity Design deficiency, new standards Water losses Chemical handling	Optimize plant, increase streams Sustain peak demand headroom Rework plant, add processes Enhance skill base Measure stage and overall volumes Control access and connections
Distribution	Lack of capacity/flexibility Low pressure Water quality Unaccounted for water	Model systems Upsize and integrate mains Increase storage/pumping Increase section/repair leaks Clean out mains/redisinfect Macrometer/repair/replace mains

Area of Risk	Type of risk	Risk Mitigation
Sewerage and Sewage Treatment		
Collection	Dangerous loads Flooding Structural failure	Control industrial discharges System cleaning Increase capacity Control of storm connections Peak demand provision Inspection, modeling, rehabilitation
Treatment	Peak flow Industrial loads Compliance criteria	System and plant buffer storage Overflows Treat at source, cost into plant Limit exotic targets Derogation/time to comply
Discharges	Contamination of water resource Extreme determinands Volume restrictions	Relocate outfalls/intercept flows Percentile compliance Balance flows and sewage strength
Sludge disposal	Blanket objection to disposal Restrictive quality requirement	Dedicated disposal sites Seek uses as product/ energy source Expose costs
Solids	Disposal	Dedicated sites, destruction

Area of Risk	Type of risk	Risk Mitigation
Common		
Earnings, funds and costs	Promise and allocation mismatch Inefficient operations Gold plated/inappropriate CAPEX Lack of current information Allocation of public funds External loan mismanagement, ignorance of covenants, ratios	Expose source of earning and funding, set ratios and shortfalls Optimize inputs and improve multifactor productivity Phase works, apply operating knowledge to design Actualize and simulate data, create appropriate allocation Obtain share, expose consequences of funding limitations Understand conditions and procedures
Tariff and Billing	Lack of customer data, failure to bill Non-inclusion of new connections Volumetric Vs Fixed	Systematic updating of billing information, protection of data base Connect works activity with administrative activity Balance vol/fixed cost

	charges Concessionary services Public body barter	components, recognize metering cost, manage volumetric provision Understand and factor in “free” supply Avoid payment in kind and favors
Collection	Political interference, pseudo customer protection Won’t pay Can’t pay	Seek relief for non-payment consequences of political imperative Impose recovery procedures Support via tariff or subsidy
Vulnerable and special interest groups	Failure to deliver to high risk customers	At-risk register, triggers in system
Design standards	Unrealistic targets Mindless copying	Balance needs, limit sizes, consider asset life relationship with design horizon Confirm local need and whether imported concepts are valid
Government Aspirations	Adoption of poorly understood standards or directives Something for nothing	Anticipate consequences and brief politicians on timing and cost Provide and explain reality

6. Autonomy and Accountability

Historically, relatively well-run public or statutory providers have been quite effective but not particularly efficient. Very few seem to have developed commercially and they may be trapped in a “right to exist” belief, seeing the Government as their ultimate employer. It may be no accident that while terms such as “user”, “population”, “connection”, “consumer” are common water sector words in many languages, “customer” is not.

If there has been a stark change in the sector in England and Wales and other countries post privatization, it is the transition from input as an end and input as a means to deliver output. This has not yet been seen in Scotland. Private companies are very much and transparently accountable for delivery of services. For the public organization, lack of Government funding and tariff restriction may continue to be used to justify service shortfall.

Though Scottish Water is accountable, there is doubt that the Scottish model provides sufficient internal drivers to incentivize the organization and its staff to perform. Scottish Water is understood to operate autonomously while interacting with the political dimension. A high degree of interference and influence by Ministers is explicit and implicit in the legal structure. Having said that, it is worth remembering that privatization does not remove local day-to-day politics but heightens political/customer awareness.

7. Regulation

Scottish Water must report to Ministers, the Commissioner, the Scottish Environmental Protection Agency and the Drinking Water Quality Regulator for Scotland. It is required to keep records of its activities and accounts, making them available for inspection and explaining them to persons appointed by Ministers. Reports must be submitted as soon as practicable and annual reports are submitted to a Convenor of the Water Customer Consultation Panels and to other noted bodies.

Scottish Water must keep proper accounts and records and prepare statements giving true and fair views. In accordance with timing directed by Ministers, statements must be sent to the Auditor General for Scotland for auditing. The Act is not prescriptive on the use of external professional accountants and certification of technical and business information, but it may be difficult for the organization to provide a true and fair view without external help⁵.

Ministers and the Commissioner regulate tariffs through the approvals and restrictions mechanisms.

8. Competition

Scottish Water is intended to be subject to competition for some of its services. However, it is a countrywide monopoly provider with a powerful asset base and more than casual relations with political power. Its domestic customer base looks to be practically secure. It faces real comparative pressure applied by the Commissioner and rising customer involvement via other regulatory mechanisms and dissemination of information. Also, of course, as a public provider, it has to compete for funding approval against other public provisions in the annual budget processes.

9. Financing

Essentially Scottish Water is tasked with financing its activities through appropriate invoicing levels, recovery of sums due, capital borrowings, funding through project specific schemes, contributions by third party customers and grants. Those activities include operations, capital investment and, if ordered by Ministers, a reasonable rate of return on the value of its average net assets. Scottish Water may, if Ministers see fit, be afforded guarantees for financial obligations. Ministers reserve a right to extract surplus funds and may direct the use of funds that are not needed for immediate use to finance functions. Hence both in the use of money and in making savings, Scottish water is much less incentivised than the English and Welsh companies who enjoy the use of savings made against their price cap before sharing them directly with customers.

Scottish Water is required to exercise its functions so that year on year its income is equal to or exceeds its expenditure. That is a public sector annual accounting approach and may not be effective in driving out inefficiency and cost. Expansion of water sales is constrained by relatively modest population growth and demographic shift. Increasing costs to customers to meet enhanced quality standards and infrastructure rehabilitation are more pertinent drivers than expansion.

⁵ Scottish Water prepares Asset Management Plans and business plans along the lines of those prepared and submitted to OFWAT by the English companies.

Scottish Water can approach the Market for public money (e.g. European development funds), quasi-public money (e.g. European Investment Bank) and commercial loans as it sees appropriate.

10. Limitations and replicability in developing countries

As a general observation, perhaps practicalities set the limitations on national and parastatal provision of water services. Water supply and sewerage are relatively cheap and essentially parochial services. Water is only moved great distances if unavoidable. At this stage there is reason to believe that the Scottish model, of a similar size to the English and Welsh water and sewerage undertakers, can successfully combine the parochial with wider responsibilities. There is a strong sense that the Act of Ministers is able to cater for low-income clients, but it is not clear whether the full fall-out of that has been considered. The model is young and hence not really tested.

It may well be replicable and usefully so, but it may be better to see it as a responsible framework. It will not remain static, so how it progresses should be tracked and adopted if appropriate. Advantages of the model are that, for advocates of public sector provision, it created a comprehensive service deliverer able to be financed and subject to scrutiny and policing all within the Government-provider envelope. The most obvious shortcoming is the level of political interference implicit in the involvement of Ministers. They have given themselves conflict of interest problems that diminish the organization's responsibility for performing.

11. Summary analysis

The focus of this paper has been on a newly designed public-provider model which is expected to be relatively successful, which can be compared with adjacent peers and which is expected to be subject to change and adaptation in the future. This is far from the situation in many developing countries. Hence in order to indicate the extent of improvement that might be possible, we include in the ratings of ingredients for success in Table B5.3 a view of the situation as it is commonly found in developing countries, and an indication of the improvement in rating that appears at this stage to be achievable by the Scottish model.

Table B5.3 Comparative Ratings of Ingredients for Success

Ingredient for success	Analysis for common model in developing countries		Analysis for Scottish model	
	Rating*	Reasons	Rating*	Reasons
Financial and management autonomy	1	<ul style="list-style-type: none"> a) Tariff levels, usually dictated by Government, may sometimes be adequate for recovery of operating costs, but very seldom for debt servicing. b) Capital finance from or through Government limited by competition from other sectors. c) Normally operate under civil service rules for employment, remuneration, and promotion – allowing little flexibility and incentive. d) Predominantly centralized management with focus on capital works and little devolution to local managers. 	3	<ul style="list-style-type: none"> a) Utility enabled to raise finance by appropriate levels of tariffs, capital borrowings, grants and contributions. b) Sources can include public, quasi-public and commercial loans. c) Potential limitations on financial autonomy include Ministerial right to extract or direct the use of surplus funds, and potential adverse regulatory and public reaction to price rises. d) Substantial degree of management autonomy but with retention of significant scope for Ministerial influence. e) Extent of performance incentive through devolution to local managers yet to become clear.
Competition	2	<ul style="list-style-type: none"> a) In some cases municipalities have the option to run their own services rather than transfer them to national utility. b) De facto competition in some cases from community organizations and private vendors. c) Little surrogate competition in the form of performance against benchmarks. 	1	<ul style="list-style-type: none"> a) Essentially a monopoly national provider. b) Subject to significant comparative pressure through regulatory Commissioner and rising customer involvement. c) Will continue to compete for funding approvals against other public provisions.
Demand responsiveness (including service to low-income households)	1	<ul style="list-style-type: none"> a) Mainly focused (necessarily in some cases) on major capital works to increase resources. b) Condition and operation of network assets frequently a matter of crisis management, with little room for response to customer needs. 	4	<ul style="list-style-type: none"> a) Obligations clearly defined in legislation and likely to be met under strong customer, regulatory and Ministerial pressures.
Incentives for expansion	1	<ul style="list-style-type: none"> a) Government usually demands it, but the usual limitations apply to practical support. 	1	<ul style="list-style-type: none"> a) Expansion of sales subject to modest population growth and demographic changes.

Ingredient for success	Analysis for common model in developing countries		Analysis for Scottish model	
	Rating*	Reasons	Rating*	Reasons
		<ul style="list-style-type: none"> b) Tariff levels can be so low that additional connections worsen finances c) Systems for contributions for the cost of infrastructure (e.g. public housing schemes) usually inadequate. 		<ul style="list-style-type: none"> b) Main drivers of increasing costs will be enhanced quality standards and asset rehabilitation.
Professional support	3	<ul style="list-style-type: none"> a) Largely available to headquarters staff, but capital works culture predominates and motivation needed to interest staff in management and commercial aspects. b) Limited extent of support for operational field staff in some cases. 	4	<ul style="list-style-type: none"> a) Very substantial sources including accumulated knowledge contact with peers in UK, Europe and elsewhere, access to specialists and consultants.
Regulation	1	<ul style="list-style-type: none"> a) External regulation usually only through ministerial intervention. b) Extent of internal regulation varies depending on Board composition. c) Self-imposed standards and performance monitoring variable. 	4	<ul style="list-style-type: none"> a) Regulation of all aspects clearly defined and extensively resourced.
Transparency and accountability	1	<ul style="list-style-type: none"> a) Usually limited at headquarters and local level. b) Annual reports sometimes published (but seldom compare performance with targets) c) Local public information most usually concerned with tariff levels 	3	<ul style="list-style-type: none"> a) Utility required to produce a Customer Standards Code, to work to an approved consultation code, and with staff and labor liaison committee. b) Continuing interaction with the political dimension may limit transparency in comparison with private providers in England and Wales.

* Rating is from zero to the highest, 5

Organization

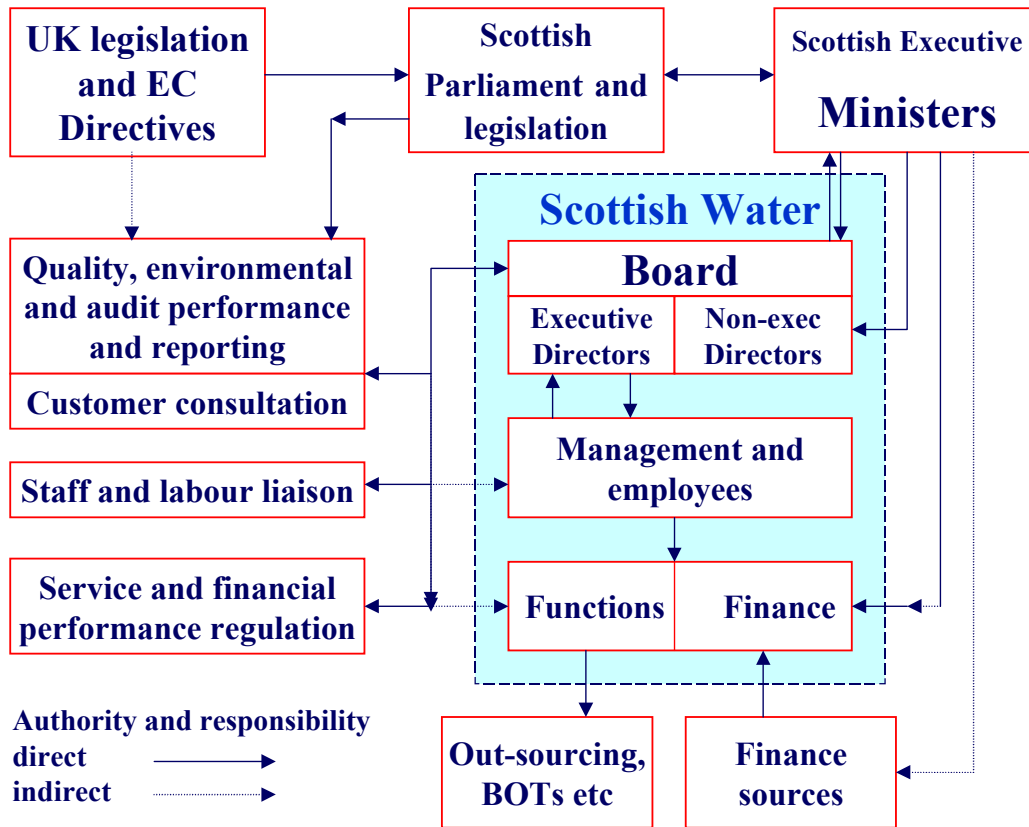


Table B5.4: Stakeholders, roles and responsibilities

Stakeholder	Role and Responsibility
Customers	Purchasers of services Payment of bills Indication of services required
Government Ministers	Set political agenda provide clear guidance Appoint Board Members Approve staffing, codes, tariffs, land disposal Provide guarantees Direct Scottish Water over a wide range of issues including use of surplus funds
Auditor General for Scotland	Audit the accounts of Scottish Water
Local Authorities	Liaise with Ministers and Scottish Water in provisions of services. If ordered, collect charges on behalf of Scottish Water
Health Boards	Respond on matters of significant health risk
Scottish Water	Provider of water supply and sewerage services Owner of services assets Employer of staff and outsource partners Delivery of capital works operations, quality product Reporting on performance and keeping of proper records Invoicing for and recovery of charges for services rendered Planning to meet service needs Acquire and dispose of land (except water rights) for core functions Report on its functions to a wide audience
Scottish Water employees	Contribute to success of enterprise and maintain welfare through representatives on liaison committees
Water Industry Commissioner for Scotland	Monitor compliance with customer standards code and efficient delivery of services by Scottish Water Brief Ministers Approve codes, tariffs Carry out efficiency and comparative performance analysis Respond to Scottish Water, Ministers and others within the timeframe set by the Act. Consider the circumstances surrounding the provision so that it can be delivered and efficiently done Promote customer interests, consult on issues and disseminate information
Drinking Water Quality Regulator for Scotland	Monitor potable water quality, set quality standards, enforce compliance Interpretation of standards, setting test levels, carrying out inspections, reporting on non-compliance
Water Customer Consultation Panels	Comment on customer matters
The Scottish Environmental Agency	Protection of land, air and water environments Maintain flood warning system Carry out health and safety at work functions Operate radioactive incident monitoring network

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B. SCOTLAND

A. GENERAL

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B. SCOTLAND

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The Water Industry Commissioner for Scotland, Ochil House, Springkerse Business Park, Stirling, FK7 7XE, Tel 01786 430200, Fax 01786 462018, E-mail enquiries@watercommissioner.co.uk

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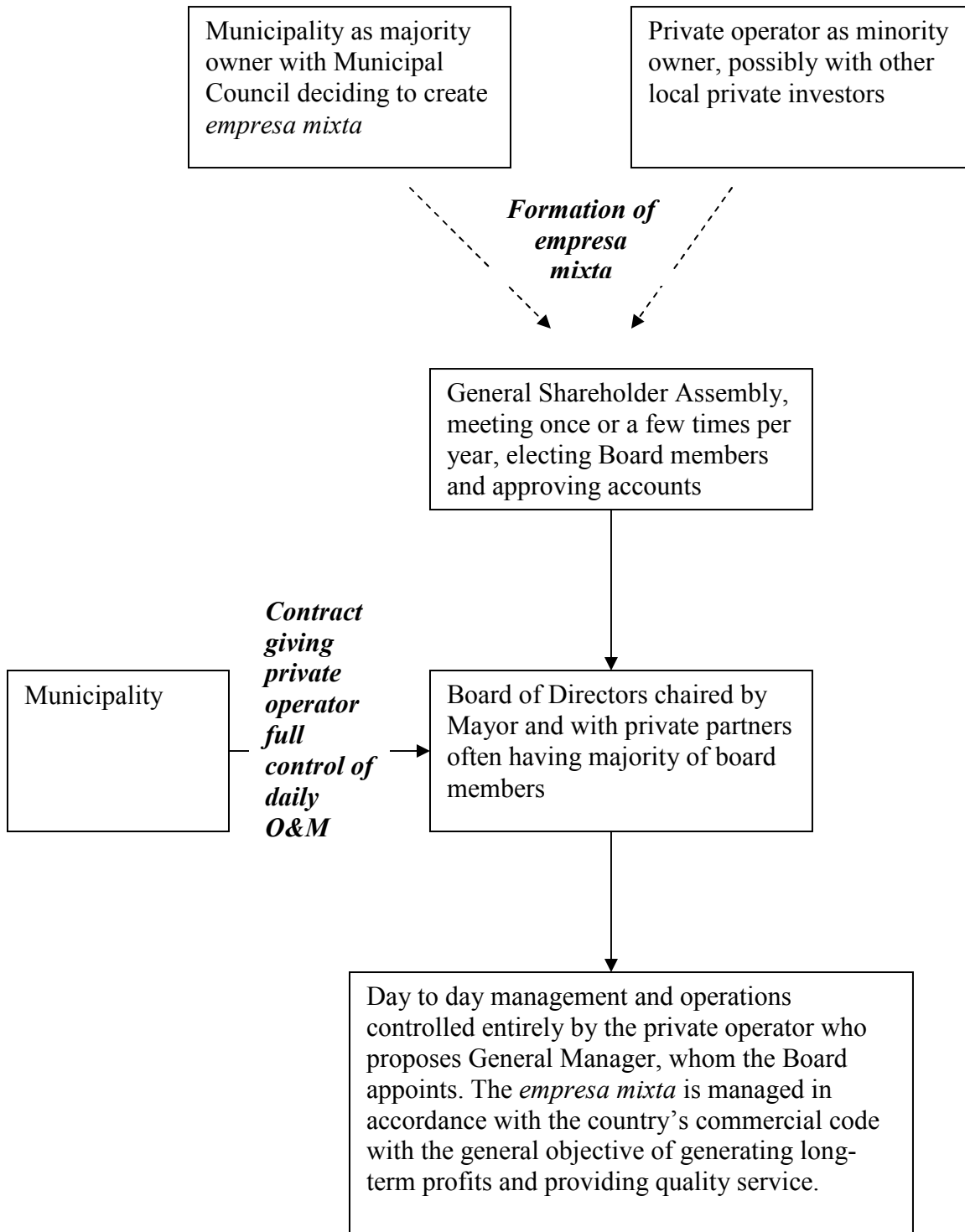
Town Water Supply
and Sanitation Services
Volume 3

**The *Empresa Mixta*:
Mixed Private-Public Ownership Companies**

Companion Paper B6

Klas Ringskog
March 2003

Organizational Diagram of “Mixed Private-Public Ownership Companies”



The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and should not be attributed in any manner to the World Bank, to its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent.

Companion paper B6: Mixed Private-Public Ownership Companies

Klas Ringskog
March 2003

1. Introduction

Mixed private-public ownership companies are of two kinds. The first is exemplified by Chile, where in 1989 the General Law on Sanitary Services created publicly owned share corporations with the possibility that the shares could be sold in future to private operators and investors. The law was amended in 1998 to permit public ownership up to 35% and private ownership for the remainder. The public ownership has been vested with the state holding company Corfo, which, starting in 1999, has sold off substantial portions of its shares in the sector's *regional* companies that in turn are made up of a large number of individual municipalities. The private and public shares vary in individual companies from some companies wholly owned by Corfo to some wholly owned by private operators. The accelerated pace of sell-offs has meant that the sector in Chile now has majority private ownership.

The second type of mixed private-public ownership is the *empresa mixta*, or “mixed ownership company”, that originated in Spain. Subsequently it has spread to other countries in Latin America. This management model is relevant to *individual* municipalities of different sizes and is the model analyzed in this paper.

2. The Spanish Model

In Spain, emergence of *empresas mixtas* followed adoption of the 1966 National Plan of Water Supply and Sanitation, which dictated that all municipalities with more than 2,000 inhabitants should receive improved services. By law it was the municipalities themselves that were obliged to shoulder this responsibility. Subsequently, a 1985 law on Municipalities codified the two alternatives for discharging this responsibility: either directly; or indirectly through partial delegation to specialized private companies, managing under concessions, leases, management contracts, or through *empresas mixtas*. A 1995 law narrows the indirect management to three choices: concession, lease, or *empresa mixta* and extends the permissible maximum duration of the contracts between the municipality and the private operator from the previous 50 years to 75 years (the original contract plus contract extensions).

In the year 2001 it was estimated that approximately 47% of water supply services and 54% of wastewater services were provided by private operators. The main provider was Aguas de Barcelona through its affiliate Aquagest that has specialized in *empresas mixtas*. The fact that Aguas de Barcelona has other types of private sector contracts makes it possible to call on employees in a large number of cities when a particular municipality with an *empresa mixta* requires specialized expertise. *Empresas mixtas* account for 10% of all privatized accounts, lease contracts account for 18%, concessions for 54% and other types of private sector contracts for the remaining 18%. In terms of the

number of contracts, the share of *empresas mixtas* is likely to be higher, since concessions and leases are more common for the largest cities. Privately managed municipalities account for a surprisingly uniform share of the municipalities in each population range, with the exception of municipalities below 5,000 inhabitants where the private sector is under-represented.

The procedures for contracting the management of a municipality's water supply and sanitation system with an *empresa mixta* involve a number of steps:

- The municipal administration prepares a feasibility study comprising the legal, financial and technical analysis that will allow the Municipal Council to consider the creation of an *empresa mixta*, a company set up with the sole purpose of operating the municipal water supply and sewerage system, and co-owned by the municipality and by a specialized private operating company;
- Public procurement procedures and bidding documents are prepared;
- The public competitive bid to select a private operator considers both a technical evaluation and a financial evaluation. The bid incorporates general instructions to bidders plus a draft copy of the bye-laws of the *empresa mixta* to be set up;
- The bye-laws define the respective percentages of public ownership through contracting municipality itself, and private ownership exercised principally by the specialized private operator but leaving the door open for other non-public owners. Usually, the *empresa mixta* is majority-owned by the municipality with say 50% of the shares. The bye-laws will also specify the amount of equity and how new investment will be financed by the public and private co-owners. Remuneration of the private operator is agreed and usually comprises a percentage of gross revenue in payment for contributing technology, administrative know-how, and commercial and accounting systems. Alternatively, the municipality can negotiate an annual payment to be paid out of revenue in return for handing over the fixed assets of the system to the *empresa mixta* for operations and maintenance.
- The contract is awarded to the private operator that offers the most attractive proposal considering the financial and technical proposal and the private partner's relevant experience.
- The municipality formally signs a contract (contained in the bidding documents) with the *empresa mixta* that gives the private operator full autonomy and obligation to operate and maintain the system, including the freedom to hire or fire staff.
- The *empresa mixta* will then become operational. Typically, the contract period in Spain may be at least 50 years and possibly up to 75 years considering extensions. The private owner/operator has full control over the daily operations.
- At the end of each fiscal year a portion of each year's profit is distributed to the owners in proportion to their relative shares of ownership of the *empresa mixta*.

Competition for the market, i.e. for the opportunity of operating the system profitably, takes place at the initial public competitive bid. Once the *empresa mixta* has been

constituted with the particular private operator, competition for the market will largely disappear for the duration of the contract.

Oversight of the *empresa mixta* is exercised at two levels: through the General Assembly of Shareholders; and via overall sector regulation. The General Assembly elects the Board of the *empresa mixta* that in turn appoints the General Manager. This level of corporate governance and oversight is analogous to that of any share company operating under the country’s commercial code. It affords the municipality full insight of the operations through its representation on the Board. The sector regulation takes two forms: (i) quality regulation of the adequacy of the water supply and wastewater services exercised for instance by the Ministry of Health and by the Ministry of the Environment; and (ii) economic regulation of the level of the tariff.

In Spain municipalities authorize tariffs under the general regulation of Price Commissions. With the creation of an *empresa mixta* the municipality both authorizes a tariff and is a part owner of the regulated body – an ambivalent arrangement. In contrast, there is no ambivalence as to who is responsible for the operations: it is the private operator and he alone. The private operator proposes candidates for the post of General Manager and lends its entire know-how to the daily operations. The incentives are clearly in favor of success, since the private operator is remunerated both for providing its know-how, such as operating proficiency and information systems, and for helping generate a profit of which it receives a share in proportion to its share ownership.

A common reason for the municipality to form a joint venture with an experienced strategic private operator is to professionalize the management by tapping the accumulated and updated know-how of its strategic partner. This motive gains importance when the quality regulation in the sector incorporates new requirements such as the treatment of wastewater and demands for higher potable water quality. In Spain these two requirements seem to have encouraged municipalities to turn increasingly to private operators.

The allocation and mitigation of the most common risks of water supply systems varies somewhat with the type of bye-laws and operating contract of each *empresa mixta*. However, the most common risk allocation and mitigation based on the common practice under *empresas mixtas* in Spain are shown in Table B6.1:

Table B6.1 Risk Allocation and Mitigation under *empresas mixtas* in Spain

Type of Risk	Risk Allocation	Risk Mitigation
Raw Water Quantity	Interregional rivers: the Central state Intraregional rivers: the Comunidad Autónoma (regional body)	Explicit contract between <i>empresa mixta</i> and the Central Government or Region regulating quantities extracted
Raw Water Quality	Ditto	Ditto
Potable Water Quality	<i>empresa mixta</i>	Quality requirements

		specified in the contract with the <i>empresa mixta</i>
Effluent Quality	<i>empresa mixta</i>	Ditto
Land Rights	<i>empresa mixta</i>	The bidding documents and bye-laws will specify
Demand Risk	<i>empresa mixta</i>	Complete metering and private partner experience will mitigate demand deviating sharply from projections
Tariff Regulation Risk	<i>empresa mixta</i>	Initial bid will be awarded on the basis of the tariff. Subsequent tariff adjustment risk is much mitigated by the fact that the municipality is majority owner and also the authority fixing the tariff
Collection Risk	<i>empresa mixta</i>	Experience, collections proficiency and strong financial incentives for private partner mitigate much of the collection risk
Operating Cost Level	<i>empresa mixta</i>	Experience of private partner who controls operations mitigate this risk
Financing Risk	<i>empresa mixta</i>	The joint private/public ownership mitigates most of this risk: the private partner provides financial know-how through its deep professional knowledge; the municipality provides the political influence to gain access to subsidized public financing
Construction Risk [cost overruns, and quality/completion]	<i>empresa mixta</i>	Usually this risk is much mitigated by sub-contracting with private contractors or directly with the private partner in the <i>empresa mixta</i> [clarify use of fixed price contracts]

The remarkable adaptability and stability of *empresas mixtas* is clear from the way risk is managed and mitigated. Formally, most of the risks affecting water supply and

wastewater operations are allocated to the *empresa mixta*, the resilience of which is due to the fact that it can rely on the respective strengths of its private and public owners. Where operational proficiency and a thorough understanding of risks are concerned the *empresa mixta* can rely on its private owner. Where political support is concerned, either with the local stakeholders or with the regional or central governments it can rely on its public owner, the municipality and on its Mayor who is the Chairman of the Board.

The *empresa mixta* is autonomous in the sense that it is managed like any share corporation. None of its owners or managing staff have any statutory latitude to make decisions that would adversely affect the *empresa mixta* or the financial and operational soundness of the water supply and wastewater system. The performance of its management is registered in the annual report of the *empresa mixta* which is a public document. In addition, the municipal council and in particular the Mayor are accountable to the consumers at large since they are part of the decision to create an *empresa mixta* and since the Mayor is the chairman of the Board. A poorly performing *empresa mixta* may ultimately impact on the political fortunes of both the municipal council and the Mayor since both are elected by the voters who are also consumers.

The congruence between the financial and political fortunes of the *empresa mixta* and the municipal administration is also underpinned by the fact that the *empresa mixta* is a local solution to local needs. There are no cross subsidies to other towns or to other regions. This will favor wealthy cities and towns and impact negatively on towns that are poor. If the *empresa mixta* identifies financial advantages by outsourcing functions to private sub-contractors it will certainly do so, even though it may be at the expense of staffing levels of the *empresa mixta* itself. The fact that the “private partner” operates under a sort of management contract, signed by the municipality with the *empresa mixta* creates an arms-length arrangement with the municipality and clearly separates the oversight, exercised by the Board of Directors, from the daily operations controlled by the private partner.

3. Replicability in Developing Countries

Empresas mixtas originated in Spain and have been replicated so far only in Latin America. Colombia has a number of them. The large city of Barranquilla presents an interesting example, where the original private partner, Aguas de Barcelona, ceded management control to a management team, backed by local private owners who collaborate with the Barranquilla municipality. The severing of ties with the original backer, Aguas de Barcelona, does not seem to have impaired operational improvements. These have continued under an excellent General Manager who has strong incentives through a personal share ownership. The example shows that *empresas mixtas* can prosper in the absence of external private partners as long as the incentives for good performance exist. Other examples of *empresas mixtas* can be found in Campo Grande, Brazil and in Mexico (Cancun and Saltillo). All in all, these three countries have *empresas mixtas* serving about four million people. The facts that municipalities can become partners who share in the profits of an *empresa mixta* and that they have full oversight in the management and strategic development through their representation on

the Board are attractive to local politicians. The political risks are substantially mitigated through this partnership and over time the *empresas mixtas* seem to become better accepted and more stable, at least in the three countries studied in Latin America.

In other countries with *empresas mixtas*, notably in Colombia, quality regulation is exercised by the national *Superintendencia de Servicios Públicos Domiciliarios* and the tariff regulation is under the National Tariff Regulator, the CRA. In addition, there is the additional public scrutiny that the annual report of the *empresa mixta* implies. Performance is reported and audited financial statements are published. As for any share corporation, the *empresa mixta* must follow the requirements of external audits, in order to protect creditors and investors but also to disseminate information to the public at large including consumers and the media.

The impression is that competition for *empresa mixta* contracts is weak, at least judging by the way *empresas mixtas* have been bid and set up in Latin America. Once the contract is in place, the successful operator is secure for the duration of the contract. As noted this period can be as long as 75 years in Spain and as long as 26 years outside Spain, such as in the contract in Cartagena, Colombia. As long as the *empresa mixta* operates normally while complying with the contractual service level targets and quality there is no reason to dissolve the particular *empresa mixta* and rebid. However, there is still some competition in the market in the sense that the highly professional management of the *empresa mixta* outsources functions where outside service contractors offer financial advantages.

The financing obligations of the public and private owners of the *empresa mixta* are specified in the bye-laws that will detail the amount of equity and the public and private ownership proportions. This paid-in equity therefore is the upper limit to the private partner's financial exposure. Typically, the private equity is not large and may initially be limited to a few millions US dollars, even in the case of large cities, such as Barranquilla and Cartagena that have 1.5 and 0.9 million inhabitants, respectively. The *empresa mixta* is expected by its partners to finance replacement of assets and system expansions out of the surplus cash that is retained in the *empresa mixta*. In addition, the *empresa mixta* attempts to capture any kind of financing available in the market. For instance, in Spain much of wastewater investments are financed with grants from the European Union. Similarly, in Colombia the *empresas mixtas* have financed many investments with external financing, guaranteed by the Government of Colombia.

Given that the private partner in an *empresa mixta* assumes only limited financing risk an *empresa mixta* is most suitable to improve on poor and inefficient operations in systems with limited investment needs. However, over time and with improved operations the cash flow surplus will be able to support gradually increasing investment programs. The financing requirements are relatively low in a mature country like Spain where demographic growth is close to zero. There, investments can be underpinned with a mixture of operating surpluses and grants and long-term borrowings, available in a well-developed financial market. The situation is quite different in developing countries. High demographic growth and lagging service levels mean that investment needs are large.

Empresas mixtas are also relatively complex to create. Experienced private operators like Aguas de Barcelona are scarce and will attempt to select those cities with the greatest potential for profit. These will typically be larger municipalities with good upside potential. Small towns are hardly prime candidates unless they are adjacent to already established *empresas mixtas*. In practice, it will be difficult for small local operators to compete with large and experienced private operators in large systems. However, it could be that the principles of *empresa mixta* could spread to smaller municipal systems in which large international operators would hardly be interested. This is where small local operators would have a comparative advantage.

Key Stakeholders, Roles and Responsibilities

Municipality	<i>empresas mixtas</i> appear most suited to medium or large municipalities. Typically, the municipalities represent mature systems that experience difficulties in operations due to the complexity, or due to an inability to generate a surplus from operations. The failure provides the driving force for seeking out a private operator in an <i>empresa mixta</i> to operate and supervise the execution of future investment programs. Municipality is likely the primary responsible for providing water supply and wastewater services and opts to discharge its constitutional or statutory responsibility through creating and <i>empresa mixta</i> with an experienced private water supply and wastewater operator.
Private operator	Enters as a minority share-holder in the <i>empresa mixta</i> but retains complete control over daily operations. The private operator has the duty to respond to consumer demand, to operate and maintain the water supply and wastewater installations, and project and formulate plans for future investments.
Regulators	The quality regulation is usually carried out by the Ministry of Health regarding the adequacy and safety of the drinking water supplied, and by the Ministry of the Environment regarding the compliance with effluent standards. The economic regulation is the responsibility of the national water supply and wastewater regulator (if it exists) or of price boards or commissions or the like.
Consumers	Are obliged to comply with the customer regulations, foremost paying the tariffs, approved by the Municipality (in Spain) or by the National Economic Regulator (for instance in Colombia)

Key Ingredients for Success

Ingredient for Success	Rating	Reasons
Financial and management autonomy	5	<i>empresa mixta</i> is operated like any autonomous company in accordance with the commercial code and with efficiency and sustainability as important objectives
Competition	3	The selection of the private partner is the result of a public bid most of the time but the evaluation and award criteria may not be transparent at all times
Demand responsiveness (including service to low-income households)	4	It is in the commercial and political interest of both the private and public partners of the <i>empresa mixta</i> to respond to all potential consumer demand
Incentives for expansion	3	System expansion is done as a function of the investable cash flow surplus and of the outside financing.
Professional support	5	The <i>empresa mixta</i> can draw on the experience and staff of the private partner who will have leading operational and technical knowledge
Regulation	4	Wide dissemination of information through the annual report and through the municipal Board representation
Transparency and accountability	4	Ditto
Summary rating	4	The experience is that an <i>empresa mixta</i> represents an excellent way to draw on the respective strengths of its private and public owners through which risk can be mitigated successfully

Recommended Case Studies and Literature

In English:

Aguas de Cartagena, Colombia is operational since 1996. It has been presented a number of times at international seminars on private sector participation.

AAA de Barranquilla, Colombia is operational since the late 1990s. It has also been presented a number of times at international seminars.

“Private Sector Participation in the Water Supply and Wastewater Sector – Lessons from Six Developing Countries” by Daniel Rivera in the series Directions in Development, World Bank, 1996 contains an analysis of Aguas de Cartagena, AGUACAR

“Meeting the Infrastructure Challenge in Latin America and the Caribbean” by Klas Ringskog in the series Directions in Development, World Bank, 1995 contains an analysis of the experience of Aguas de Murcia in Spain

In Spanish:

A number of presentations have been made on *empresas mixtas* at seminars organized by the World Bank Latin America and Caribbean Technical Department in venues such as:

- Alicante, Spain June 14-18, 1993
- Murcia, Spain November 7-11, 1994
- La Laguna, Spain June 2-5, 1997

BNWP Town WSS Initiative

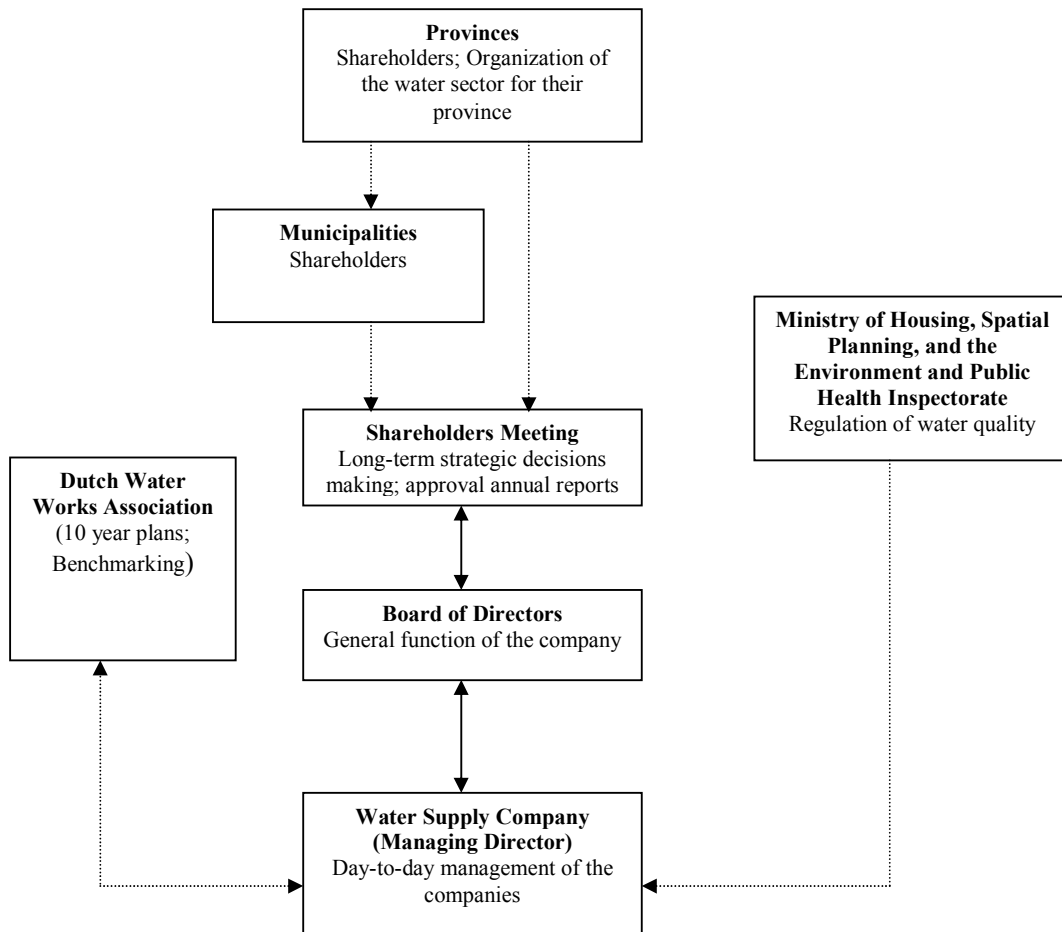
**Town Water Supply
and Sanitation Services
Volume 3**

**Government-Owned Public Limited
Companies**

Companion Paper B7

**Klaas Schwartz, UNESCO-IHE
March 2003**

Organizational Diagram for the Government-owned PLC model in the Netherlands



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Companion Paper B7: Government-owned Public Limited Companies

Klaas Schwartz, UNESCO-IHE

March 2003

1. Introduction

The government-owned public limited company (PLC) is a widely used mode of engagement in the water sector world-wide. It is found not only in Europe, where it is (or has been) used, in the Netherlands, Poland and Germany among others, but also in Latin America (Chile counted 13 government owned *Sociedades Anonimas* in 1999), in Asia where a few examples existed in the Philippines in the 1990s, and in Africa where The Lusaka Water and Sewerage Company is a private limited company, fully owned by the Lusaka City Council, but operating under the Companies Act of the Republic of Zambia. The essence of the government-owned PLC is that the utility is established and operates under company law whilst the shares of the company are in hands of national, regional or local government authorities. Generally, there is no legal or organizational difference between a publicly-owned and a privately-owned PLC apart from the government ownership of shares (Schwartz and Blokland 2002). In this paper, we describe the quite successful operation of Dutch water supply companies, which are publicly owned.

2. Legal Basis and Company Law

The government-owned PLC is a widely used organizational form in the Netherlands where it has been or is used for companies as diverse as the national railway (NS), KLM Royal Dutch Airlines and the Postal and Telecommunications Service (PTT)¹. In the Dutch water supply sector, the government-owned PLC is still the most prevalent form of service provision. In 2000, the Dutch Parliament adopted a resolution stating that water supply companies should be owned by public sector agencies. That makes privatization of the Dutch drinking water sector (in the sense that shares of the companies would be sold to the private sector) unlikely in the short term. The legal basis for the provision of drinking water derives from the Drinking Water Supply Act, which was originally adopted in 1957 and revised in 1975. The Act attributes responsibilities to a variety of actors in the drinking water sector. The main responsibility for overseeing drinking water provision is attributed to the Provinces, who are responsible for the supply of drinking water in their own province. The water supply companies have the actual responsibility of delivering drinking water.

Table B7.1: Responsibilities attributed by the Drinking Water Supply Act

Actor	Responsibility
Ministry of Housing, Spatial Planning, and the Environment	<ul style="list-style-type: none">• Introduce General Administrative Measures to regulate quality and supply of drinking water;• Prepare a long-term policy plan that will ensure supply of drinking water;
Provincial Government	<ul style="list-style-type: none">• Develop (reorganization) plans for the drinking water industry for the province.
Public Health Inspectors	<ul style="list-style-type: none">• Make sure water supply companies comply with General Administrative Measures;• Make sure hygiene standards in drinking water companies are met.
Netherlands Waterworks Association (VEWIN)	<ul style="list-style-type: none">• Develop a Ten-year Plan to function as a coordinating mechanism for the individual plans drafted by the drinking water companies and the plans drafted by the Provincial and National government.
Drinking Water Companies	<ul style="list-style-type: none">• Supply decent drinking water;• Develop a plan relating to the future development of required waterworks.

¹ In the past decades many of these companies have been privatized and are no longer government owned.

Source: Schwartz 1999

Dutch company law defines, in broad terms, the main characteristics of a PLC as well as the main rights and obligations of the various actors in a PLC. It identifies three main actors: the Shareholders, the Board of Directors and the Managing Director, and states that each company must adopt articles of association at the time the PLC is established². The articles of association are drawn up before a public notary and need to be approved by the government for compliance with private company law. These articles may stipulate, among other things: company objectives; maximum capital outlays or loans that the Managing Director can decide upon independently; the composition of the Board of Directors; the ownership and transferability of the shares; the number of annual shareholder meetings; and the financial result which is to be obtained and how it is to be utilized. The articles also specify in greater detail the powers held by the Board of Directors, the Managing Director, and the Shareholders. The articles of association actually define in detailed terms the operating structure of the PLC.

3. Ownership, oversight and operations

In the Netherlands, the water companies are generally owned by a combination of municipalities serviced by that water supply company or the province in which the water supply company operates or a combination of these two³. As such, the companies are owned by local stakeholders. Dutch water supply companies tend to have multiple (government) shareholders (see Table B7.2). Fixed assets, however, are owned by the water supply companies themselves and not directly by the municipalities⁴. This is important in light of the utility's ability to use the fixed assets as collateral for securing loans from commercial banks.

The task of overseeing the functioning of the company is attributed to two actors, the Shareholders Meeting and the Board of Directors. Through the articles of association, the powers of the Shareholders Meeting are limited to approval or rejection of the annual accounts, proposals to amend the articles of association, and ultimately, proposals to dissolve the company. Although the shareholders theoretically have the opportunity to adjust the balance of powers by amending the articles of association, they generally refrain from doing so.

The Board of Directors is responsible for supervision of the company's management and of its general functioning. In Company Law it is specifically stipulated that in performing their tasks the Board of Directors are to be guided by company interests. The Board has free and unlimited access to all company facilities and information and can advise the Management of the company on any issue it considers relevant. Although the principle of majority voting applies, a formal vote is seldom necessary in Dutch Water PLCs. Among the more important tasks of the Board are, generally, the appointment, dismissal and suspension of the Managing Director⁵, and approval of the annual plan. The Board of Directors is a vital linchpin in the governance of the water supply companies, looking outward to the government shareholders and other stakeholders on the one hand, and inward to the management of the company and its staff on the other (Thynne 1998).

Table B7.2: Ownership of Shares and Composition of the Board of Directors of Three Water Supply Companies

	WML	PWN	WBE
No. of Shareholders	56 municipalities + the Province of Limburg	The Province of North-Holland	29 municipalities

² The articles of association have to be included in the founding document.

³ There are exceptions to this general rule.

⁴ In other examples of government owned PLCs, the shareholders do maintain ownership of the assets, as is the case in Lusaka, Zambia, where the Lusaka City Council owns the utility assets and 'leases' these assets to the Lusaka Water and Sewerage Company, of which the Lusaka City Council is the sole shareholder.

⁵ The appointment and dismissal can also be the responsibility of the Shareholders Meeting (art 132 BW:2).

Composition of the Board of Directors	6 Municipal representatives 1 Provincial representative 2 Professionals	3 Provincial representatives 4 Professionals	8 Municipal representatives, 1 Professional
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WML – Water supply company Limburg, PWN – Provincial water supply company North Holland, WBE – Water Company Europoort.

Day-to-day operation of the company falls under the responsibility of the Managing Director (MD). The MD is also the company’s legal representative unless stated otherwise by law. Decisions and actions taken by the Management must be directed at realizing company goals. By law, the MD is also responsible for presenting the annual accounts to the Shareholders Meeting and the Workers’ Council within five months of the closing of the financial year. Within the PLC structure the MD has a bridging function, cushioning the impact of the Board of Directors on the work of the company’s staff and interpreting particular demands from the Board of Directors to the staff. At the same time the MD represents the interests of the staff before the Board (Thynne 1998).

4. Professional support

Historically, representatives from the government shareholders populated the Board of Directors of Dutch water supply companies. The main reason was that the municipalities and provinces wanted to maintain close oversight of the provision of an essential service. These Board Members (generally the mayors of the municipalities⁶) were not well versed in the technical, financial, and commercial aspects of the drinking water industry. The result was a serious imbalance between the knowledge of the Board Members and that of the MDs when it came to running the water supply company. Over the past decade, however, the composition of the Board of Directors has progressively changed. Sector professionals, non-government representatives with a wealth of experience in the water sector, have been attracted, to assist the remaining government representatives on the Board of Directors to mitigate the imbalance. In essence, the Board of Directors of many water supply companies is undergoing a continuing process of “professionalization”⁷. Although many companies still count a majority of government representatives, many seem to be aiming for a situation in which half the Board Members are sector professionals and half are government representatives.

5. Risk analysis

Table 3: Risk Analysis

Type of Risk	Risk allocation	Risk Mitigation
Raw Water Quantity	National government for large rivers and lakes. Provinces and Water Boards for groundwater.	
Raw Water Quality	National government for large rivers and lakes. Water Boards for groundwater and smaller rivers.	
Potable Water Quality	Water companies	Potable water has to meet specified quality standards, which are regulated by the Ministry of Health.
Effluent Quality	Water Boards	Effluent quality has to meet standards stipulated in legislation deriving from the European Union.

⁶ It should be noted that Dutch mayors are generally appointed by the Central Government and are not subject to periodic elections.

⁷ The process of professionalization has been slow, however, as giving up a claim to a seat on the Board of Directors is politically sensitive change.

Land Rights	Water companies	
Demand Risk	Water companies	The water companies have a monopoly on water service provision for their services area
Tariff Regulation Risk	Tariffs are either set by the Shareholders Meeting (i.e. the owners of the company) or the Board of Directors.	The owners of the company (the municipalities and provinces) or the Board of Directors (with representatives from the owners) set the tariffs. There is no 'outside' economic regulation at present.
Collection Risk	Most water companies keep collection of bills in-house, though it could also be contracted out to third parties	The water companies (which have a monopoly) have the possibility of cutting off service provision (for which they have to follow a strict process)
Operating Cost Level	Water companies	
Financing Risk	Water companies	Because of their status as government-owned PLCs, which provide an essential service to consumers, the water companies can obtain loans at favorable rates.
Construction Risk [cost overruns, and quality/completion]	Water companies	Generally, private construction companies are contracted for construction of the facilities. The contracts that the water companies have with these construction companies can mitigate the risks involved substantially. At present, no BOT contracts exist in the water supply sector.

6. Autonomy and accountability

The PLC structure provides a broad general framework. The actual level of autonomy of the utility is strongly dependent on how this general framework (which is applicable to all PLCs, both public and private) is filled in by the articles of association. According to Dutch company law, the shareholders are granted "all powers, within limits set by Law and articles of association that are not bestowed upon the Management or others"⁸. As such, the shareholders have considerable possibilities to attribute themselves far-reaching powers. In the Netherlands, however, the shareholders have attributed most powers to the Board of Directors and the Managing Director. This, in essence, means that the autonomy of the utility is considerable. Table B7.4 provides an overview of which powers have been attributed to which actor for two water supply companies.

Table B7.4: The Attribution of Powers by the Articles of Association for Two Water Supply Companies (MD-Managing Director, BoD –Board of Directors, SM-Shareholders Meeting)

Responsibility	WML	WBE
Bill and Collect for Services	MD	MD
Terminate Service Provision to Defaulters	MD	MD

⁸ art. 107 BW:2

Determine Tariff Structure	SM	SM
Set Water Tariffs and Connection Fees	SM	BoD
Enter Loan Agreements	MD (limited), BoD	MD (limited), BoD
Procure Goods and Services	MD (limited), BoD	MD (limited), BoD
Procurement of Assets	MD (limited), BoD	MD (limited), BoD
Hire and Fire Individual Staff Members	MD	MD
Promote and Demote Individual Staff Members	MD	MD
Determine Salary and Incentive Structure	BoD	BoD
Determine Structure of the Organization	MD	MD
Define Internal Work Processes and Standards	MD	MD
Hire and Fire the Managing Director	BoD	BoD
Appoint and Dismiss Board Members	BoD	Municipalities
Appoint External Auditor	SM	SM
Approve Rolling Multi-year Business Plan	SM	SM
Approve Annual Plan	BoD	BoD
Approve Annual Report (budget/audit report)	SM	SM
Share Issue	SM	SM
Participate in Other Enterprises	SM	MD (limited), BoD
Dissolve Company	SM	SM
Amend By-laws	SM	SM

Source: WML and WBE Statutes, as cited in Blokland and Schwartz 1999

The mechanisms of accountability in Government-owned PLCs have several dimensions. First, the MD is accountable to the Board of Directors. The Board of Directors has free and unlimited access to all company facilities and information. Periodic meetings (usually monthly) are held in which the Board,

Textbox: The price of water in the Dutch drinking water sector

Tariffs in the Dutch drinking water sector generally incorporate 2 components. One component is an annual fixed charge, which does not change with the amount of water consumed, the second component is a variable charge depending on the amount of water consumed.

Both the fixed charge and the variable charge show considerable differences between different regions in the country (and even within the same regions). The fixed charge varies between a little less than € 14 per year to more than € 63 per year (with an average of €42 per year). The variable charge (the actual € per m³ of water consumed) varies from €0.78 to € 1.57 (with a national average of € 1.28 per m³ of water). The differences in prices are largely explained by the differences in the cost of service provision in different regions. For example, the eastern part of the Netherlands generally uses groundwater for the production of drinking water. The Western part of the Netherlands uses surface water (as the groundwater in this region is brackish due to saltwater intrusion from the North Sea). The more expensive treatment of surface water is translated into higher drinking water tariffs and consumers in the Western part of the Netherlands generally pay higher tariffs than consumers in the East.

in the presence of the MD, discusses the current issues. The Board of Directors has to approve the annual plan and the annual report (which must also be externally audited by a certified accountant).

Second, the Board of Directors and the MD are accountable to the Shareholders Meeting. After the Board of Directors has approved the annual report, it is sent to the Shareholders Meeting for approval.

The audited report (once approved) is subsequently deposited at the local chamber of commerce, where it is open to public scrutiny. In addition, Company Law provides regulations against mismanagement of the utility. The MD and the Board of Directors can be held personally responsible for mismanagement.

In other countries, accountability and transparency have been arranged in other ways. In Chile, for example, an independent regulator was charged with the supervision of utilities. In the Philippines, the Board of Directors consisted of a representative from the Civil Service, a women's organization, a representative of the educational sector and a representative of the business community.

7. Regulation

The Dutch water supply sector has regulation only of drinking water quality, which is the responsibility of the Ministry of Health. The European Union has adopted quality standards, which have to be met, but Dutch water supply companies have to adhere to even more stringent standards. Although in past years intentions surfaced for the establishment of an economic regulator (under the Ministry of Economic Affairs), the Dutch water sector does not at present have economic regulation. Responsibilities for tariff setting are arranged in the articles of association and are generally attributed to the Shareholders Meeting or the Board of Directors.

8. Competition

Dutch water companies generally have a monopoly on service provision⁹, so there is no real competition for the market. The water sector does have a proxy for competition in the market, in the sense that many water supply companies join an annual detailed benchmarking study. An association of regional water supply companies named COCLUWA started this closed financial and technical accounting system, which has led to annual rounds of voluntary performance comparison among COCLUWA members. The system was developed in the late 1980s and implemented by the 11 COCLUWA members from 1989 onwards (Braadbaart et al. 1999). The benchmarking has been taken over by the Netherlands Waterworks Association, which conducts the exercise annually and provides bi-annual public reports in which the performance of the water utilities is assessed (VEWIN 2001). Currently almost all Dutch water utilities are part of the benchmarking exercise.

9. Financing

Although the initial expansion of water supply in the Netherlands was not without government subsidies, all the companies now have to be self-sustaining and finance their recurrent costs and investments themselves. Recurrent costs consist of operating costs, depreciation and interest payments. Over the years the tradition has grown that the utilities recover their recurrent costs from tariffs.

⁹ Exceptions do exist for large industrial users who can develop their own source for water for their own use (for which a provincial permit is required).

The most important financial instruments for the water supply companies are potentially loans, bonds, project finance and share issue or sales. However, as the Dutch government has prohibited the sale of shares to non-public sector entities, the potential of share issues and sales is relatively limited. Grant financing in the water supply sector close to unheard of, leaving loans as the main source of capital for investments¹⁰ (van Dijk and Schwartz 2002). Usually, investments are financed from depreciation charges and reserves but require loans as well. Loans are obtained from a variety of financial institutions. Dutch water utilities have obtained their investment capital from commercial banks, the Netherlands Waterschapsbank (NWB – see Box B7.1), pension funds and insurance companies. Compared to other sectors the water utilities can borrow on highly favorable terms. They can draw loans without government guarantees, but are still offered lower rates than other firms. The reason for the generous terms lies with the sector’s low-risk profile. The combination of a government-supported monopoly structure, government ownership, and a steady demand virtually guarantees a return on investment (Braadbaart et al. 1999; ABN-AMRO 1996).

Municipalities have also played a crucial role in ensuring the utility’s access to finance. In the case of Water Supply Company Friesland, loans were obtained on the grounds of projected company income from new service areas (previously unserved municipalities). This income was secured by a contract between the utility and the municipalities. In these contracts, the unserved municipalities guaranteed a minimum use of water against a set price¹¹.

Box B7.1 The Nederlands Waterschapsbank (NWB)¹

The NWB was formed in 1954 and is the most prominent financial institution in the financing of activities undertaken by the water supply companies. The NWB, which is fully owned by the public sector, operates almost exclusively in the Netherlands and supplies services only to the public sector, providing funding to provinces, municipalities, water boards, water supply companies and environmental corporations. The provision of long-term finance to the water supply companies continues to be a key area of NWB’s business.

Table B7.5: Balance of the NWB 1997-2001 in € million

	2001	2000	1999	1998	1997
Long-term loans and advances	18,256	15,539	14,465	14,162	13,746
Capital base	921	834	750	667	589
Total assets	22,634	18,535	17,083	15,851	15,116

Source: <http://www.nwb.nl>

10. Limitations

As mentioned earlier, the PLC structure provides a general framework, which is filled in by the articles of association. The actual checks and balances present in a PLC and the degree of autonomy enjoyed by a PLC depend strongly on the articles of association. The articles of association are drawn up by the shareholders (all government agencies) who, as such, have considerable influence over the governance structure of the utility. As such, there is a threat of ‘government capture’ of the utility by an ill-willing government agency¹².

¹⁰ Although project finance is virtually non-existent, the Dutch water utilities do make extensive use of private sector involvement, generally by way of service contracts.

¹¹ This also provided a strong incentive for those previously unserved municipalities to ensure that as many households as possible connect to the system, as the higher the number of households connected the more likely it is that they would consume the minimum use of water guaranteed by that municipality.

¹² This risk is considerably lessened by having multiple minority government shareholders in one utility.

Another limitation may be the general (legal) environment within which the utility operates. In Zambia, for example, government agencies had outstanding debts amounting to ZMK 16 billion in 1998 (The Post, August 14th, 1998) to the Lusaka Water and Sewerage Company (LWSC). Even if the LWSC were able to obtain a judgment against a government department, it would be unable to levy restraint against government assets as a result of the State Proceedings Act, which makes clear that such a decision would not be enforceable (Severn Trent 2002)¹³.

Much also depends on the ‘quality’ of the different actors in the PLC structure. If the Board of Directors is only populated by government representatives with no prior experience in the water supply sector, this is likely to have an adverse impact on the performance of the utility.

The PLC structure is arranged by company law, so much depends on how company law is enforced in a country. In countries with weak enforcement of laws and regulations, the potential benefits provided by this structure are limited. With government ownership of the utilities, there is a danger that once the utility operates sufficiently well, the drive to increase efficiency will disappear. Most (though not all) utilities stipulate that no (or only limited) dividend payments are allowed. Because the shareholders are not entitled dividend payments they are unlikely to push for further efficiency-increasing measures when they consider performance to be satisfactory¹⁴.

11. Replicability in developing countries

The replicability of this mode of engagement is essentially linked to two issues:

- 1) *If this mode of engagement is allowed by law in that country.* In some countries the legislative framework does not allow government agencies to own public limited companies. In other countries, restrictions are placed on the government ownership of utilities. In New Zealand, for example, it is a ‘constitutional convention that government requires explicit statutory authority before acquiring a shareholding in any company [...]. Accordingly, there are no cases of companies used as instruments of state action where the only statutory framework is the Companies Act’ (McKinlay 1998). In cases where such limitations exist, the replicability may be limited.
- 2) How the local situation deals with limitations outlined in Section 10. Employing the PLC structure requires enforcement of company law, (multiple) shareholders who are willing to provide the utility with the necessary autonomy, a Board of Directors which incorporates sector professionals as well as government representatives, and shareholders with a desire to keep pushing for efficiency gains.

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¹³ It should be noted, however, that this limitation is not specific to the PLC structure. If the water supply and sanitation services in Lusaka were organized according to an alternative mode of engagement, the limitations posed by the State Proceedings Act would still exist.

¹⁴ This risk can be mitigated somewhat by benchmarking exercises between the utilities, which provide an incentive to perform better than the ‘other’ utilities which are part of that benchmarking exercise.

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VEWIN (2001), *Reflections on Performance 2000: Benchmarking in the Dutch Drinking Water Industry*, Rijswijk: VEWIN.

Annex 1: Key Stakeholders, Roles and Responsibilities

Province

The provinces are responsible for the organization of the water sector in their province. They are sometimes also shareholders in the utility.

Municipality

The municipalities play a large role as shareholders of the utility. Often the municipalities also contribute to the membership of the Board of Directors. Historically, the municipality played a large role in the expansion of service coverage by entering contracts with utilities in which they ensured a minimum amount of water that the inhabitants of that municipality would consume. On the basis of that contract, the utility could obtain a loan to expand service coverage.

Shareholders Meeting

The Shareholders Meeting, which is to be held at least once a year, is granted “all powers, within limits set by Law and articles of association, that are not bestowed upon the Management or others” (art. 107 BW:2). Although article 107 seems to attribute considerable powers to the shareholders, in most PLCs the shareholders have little direct control over the management of the company because of limits set in the articles of association. Generally, the powers of the shareholders are limited to approval or rejection of the annual accounts, proposals to amend the articles of association, and ultimately, proposals to dissolve the company.

Board of Directors

The Board of Directors is responsible for supervision of the Management of the company and of the general functioning of the company. Article 139 (BW:2) specifically stipulates that in performing their tasks the Board of Directors are to be guided by company interests. Similar to the case of the Managing Director, Company Law dictates that the Board Members can be held personally responsible for any mismanagement of the company. The Board has free and unlimited access to all company facilities and information and can advise the Management of the company on any issue it considers relevant

Managing Director

The Managing Director is responsible for the day-to-day management of the company. The Managing Director is also the company’s legal representative unless stated otherwise by law. Decisions and actions taken by the Management must be directed at realizing company goals.

Netherlands Waterworks Association (VEWIN)

The VEWIN was founded in 1952. VEWIN’s statutory aim is to ‘promote a healthy development of the public water supply in the Netherlands, among other things with regard to the Drinking Water Supply Act. VEWIN also seeks to promote the interests of its members as long as these interests do not conflict with the healthy development of the public drinking water supply’¹. Only water supply companies can become members of VEWIN, which can be considered the main interest group for water supply companies. It undertakes various activities, including producing publications about aspects of the drinking water sector, develops the ‘Ten-year Plans’, consults with government organizations and environmental organizations, lobbies against or in support of government policies, organizes seminars and symposia, and undertakes legal action if required.

Consumers

Consumers essentially have two ways of exerting limited influence on the decision-making process in the water supply companies. These are: influence over the democratically elected municipal and provincial bodies that own the water supply companies; and direct customer relations, which constitute an important source of information for the management of the water supply companies. The influence over the democratically elected owners of the utilities appears to be of very limited importance for two

reasons. First, consumers tend to be quite satisfied with the performance of the water utilities¹⁵. Second, elections are based on a multitude of issues and the satisfaction levels of consumers would imply that water services provision does not figure prominently on the political agenda. Direct customer relations with the utility create a more effective mechanism by which the consumer can influence decisions taken by the water supply company. It should be noted however that direct customer relations does not entail direct involvement in the decision-making process. It has much more a signaling function, indicating which aspects of service provision need to be addressed by the utility. The more complaints about one aspect of service provision, the larger the pressure on the management of the water supply company to address this problem.

¹⁵ Over 90% of the consumers are 'very satisfied' with the quality of services provided and the average mark they give their water company (7.6 out of 10) compares favorably with marks given to public transportation companies (5.6) and the mail service (6.9) (VEWIN 2001)

Annex 2: Key Ingredients for Success

It is difficult to give an accurate assessment of the key ingredients for success. This is because a number of the ingredients mentioned below are determined by the articles of association and not by the PLC structure in general.

Ingredient for Success	Rating	Reasons
Financial and management autonomy	5	The shareholders have overwhelmingly delegated most of the powers to the Board of Directors and the Managing Director.
Competition	2	There is no competition for the market. The only proxy for competition is an annual benchmarking exercise.
Demand responsiveness (including service to low-income households)	3	Consumers influence the company by way of their electoral power for municipalities and provinces. In addition, customer complaints provide a valuable source of information for the utility on how to improve its service.
Incentives for expansion	4	Currently, the Netherlands has 100% service coverage. Historically, however, the municipalities provided off-take guarantees to the utilities at a set price, on the basis of which the utilities could secure loans for service expansion.
Professional support	4	In recent years a professionalization of the Board of Directors has taken place in which sector professionals are added to the Board.
Regulation	2	Regulation only exists in relation to drinking water quality, and is done by the Ministry of Health
Transparency and accountability	5	Company Law and the articles of association incorporate a variety of mechanisms to provide for transparency and accountability.
Summary rating	4	The Government-owned PLC structure can provide a strong framework for service provision. Much depends, however, on how this framework is filled in by the articles of association.

Annex 3: Recommended Case Studies and Literature

ABN-AMRO (1996), *De Watersector*, Amsterdam: ABN-AMRO Bank. (only available in Dutch)

Blokland, Maarten W., Braadbaart, Okke D. and Schwartz, Klaas (eds.) (1999). *Private Business, Public Owners: Government Shareholdings in Water Enterprises*. The Hague: Ministry of Housing, Spatial Planning and the Environment. (also available in Spanish). Includes case studies on examples of PLCs in the Netherlands, Chile, Poland and the Phillipines.

Dijk, M.P. and Schwartz, K. (2002), *Financing the Dutch Watersector, the Present Situation And Future Challenges*, a Paper Invited by the Netherlands Water Partnership (NWP) in Preparation for the Financing Water Infrastructure Panel in the Hague, On October 8-10, 2002.

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Town Water Supply and
Sanitation Services
Volume 3

Outreach Training Systems in Nigeria

Companion Paper C1

Jack Creswell
August 2003

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Companion Paper C1: Outreach Training Systems in Nigeria

Jack Cresswell¹

August 2003

Introduction

Shortage of skilled personnel is a critical constraint on local operation and management of town water systems. Whichever management model is adopted – Water User Association, Water Board, Municipal Water Department, or local private operators – the management and upkeep of piped water systems demand expertise and experience that is not readily available in a small town situation. Both operational staff and management need training, and that training has to be suited to the special needs of their particular systems.

Conventional training, through attendance at courses and seminars, rarely fits the bill. The cost is high; it is hard to spare staff from their day-to-day duties; and training packages may well not be specific enough to equip trainees for their specialized tasks. On-the-job training overcomes these shortcomings, except that, in most cases, it is hard to find skilled trainers at affordable cost to undertake training in remote areas. Experience on the Nigeria National Water Rehabilitation Project (NWRP) suggests that outreach training can be a highly cost-effective way for governments and donors to build local capacity and improve the sustainability of town water supplies.

The primary objectives of the six-year World Bank-funded NWRP were a reliable supply of safe water for towns throughout the country, and increased revenue for water providers. Nearly 250 towns were included in the project. The town water systems faced many operational challenges: valves controlling pipe networks were leaking or seized; treatment of water was uneven; leaks were not adequately located and repaired; many pumps were faulty or inoperable; boreholes supplying some of the towns were silting up or becoming polluted; and some powered boreholes had quit functioning due to electrical faults. In most towns, a significant portion of consumers were not billed and unaccounted for water was as high as 40 percent in a few larger towns.

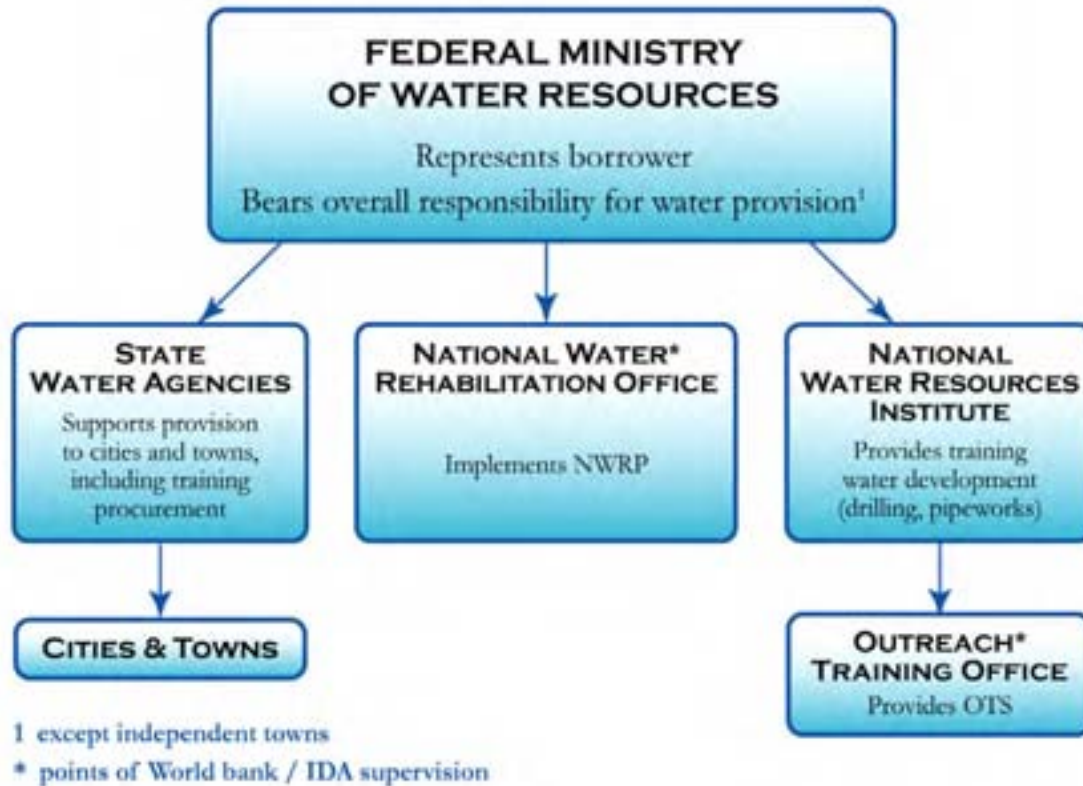
Before the start of the NWRP, training, apart from casual on-the-job exchange of skills, consisted almost entirely of seminars and attendance at courses offered by private training institutions. Almost none of the courses were related to the capacity-building needs of water providers, and many were so expensive as to enable few staff to attend – and then usually only senior personnel.

It was in this environment that an innovative needs-targeted training program – the outreach training system (OTS) - was designed and introduced in collaboration with the project implementation office representing the Ministry of Water Resources, state water agencies, local governments, the World Bank/IDA, the NWRP supervision team and the

¹ The author acknowledges the contribution of Timothy Abiodun Aderonmu, head of the outreach training system office in Kaduna, Nigeria, to the data contained within this paper.

Nigeria Water Resources Institute (which provided training for drilling and for water resources management, and became the logical home for the OTS).²

The OTS operated for the last four years of the NWRP.



The outreach training system

The goal of the OTS was to provide cost-effective, practical, on-the-job training in the trainees’ own workplace. The concept was to provide needs-targeted competency-based training at the state water agency and town level using private sector experts to help design training modules and to deliver them in the workplace. The OTS was to be administered from a central OTS office or “Help Desk” with minimal staffing.

Private sector experts were chosen because of their practical expertise and their credibility. Had the OTS office hired instructors, its ability to respond to training needs would be limited to the expertise of the hired instructors – and would have created a constant payroll cost.

The provision of training by the OTS office consists³ of five steps:

² The concept and design of the OTS originated with the World Bank/IDA NWRP training consultant

³ The present tense is used as the OTS is still operating

- Identification of training needs based on requests from towns through the “human resources officer” of each state water agency (who liaised with town water providers and passed on requests to the OTS office);
- Specification of competency-based objectives for each course;
- Development of one-week and two-week modular competency-based courses⁴ by OTS training design experts working closely over two or three weeks with a contracted private sector expert;
- The delivery of training in the workplaces of the requesting town;
- An assessment of the impact of the training.

Skills development targets were defined in three ways:

- An analysis, by the manager of the OTS office, of staff profiles and training needs;
- An assessment of training requests submitted in terms of their relationship to the broad objectives of the NWRP;
- A judgment by the OTS office concerning the likelihood that several towns would also ask for the requested training.

The OTS office focused first on provision of O & M training to operatives because of their critical role in providing access to safe water, and because few operatives had received organized training. The office planned to expand the OTS “upward” once the system had proved effective at the operative training level.

Piloting the OTS

As a first step to mounting a pilot, the OTS office selected a single request for training and designed a single modular competency-based short course on pump maintenance and repair, which it was thought would be widely requested. This and subsequent courses were divided into one-day modules to help the contracted experts to pace the training.

The one-week pump course was designed in collaboration with the chief technician from the supplier of most of the pumps in Nigeria, and delivered by the same expert to a group of 20 operatives in the workshops of a town in Bauchi state, which had requested the training through the Bauchi state water agency. The requesting town was obliged to identify participants,⁵ arrange for training space and resources in the participants’ workplace, arrange lodging and meals for the expert, disburse funds, and implement impact-assessment protocols three months and six months after the training course.

The pump course was delivered by the expert in a practical hands-on manner as intended, and it was quickly apparent that the operatives were enthusiastic, were learning, and were willing to practice newly acquired skills (every course required trainees to demonstrate competence). The group managed to restore a number of inoperable pumps to an

⁴ A small number of courses were up to three or four weeks in length: one, an induction course for engineers was 12 weeks long.

⁵ The OT Office assessed each list of nominees to ensure the duties of each participant were related to the objective of the requested training.

operational state – a success that buoyed morale (as did the very provision of training). A staff member from NWRI attended the Bauchi pilot session, and several others that followed, to observe quality of delivery and to evaluate the merits of the outreach training concept in practice.

In terms of payment, the OTS office calculated the overall cost of the course, and sent a cheque through the Bauchi agency to the town to enable the town to pay all costs directly, including the fee to the expert (to create a client-consultant relationship).

After an additional nine one-week training courses were designed, delivered, observed, and analyzed, it was apparent that the outreach idea was working. Training was popular with both the operatives and their managers, and the pilots indicated that on-the-job training could be supplied at a relatively low cost: about \$US 90 per week per participant inclusive of all costs. The success of the pilots resulted in a decision to continue the OTS and to expand training to include courses for a wide spectrum of state water agency local government staff, including technicians, finance staff, and members of management.

Finance

Long-term assured funding was now needed. Discussions between the World Bank/IDA and the Federal Ministry of Water Resources (FMWR) resulted in agreement that training for the remaining years of the project would be supported 60 percent by FMWR, i.e. the federal government's own funds, and 40 percent by NWRP loan funds. The creation and equipping of the OTS office was directly paid for by the FMWR. To promote participation by states and towns, the FMWR withheld 5 percent of the project funds allocated to each state (on the basis of population) to create a dedicated OTS fund.

The OTS office expended \$US 750,000 to fund about 8,000 trainee weeks during the four years it operated within the project. To cover staff salaries and overheads, the OTS office received a fee of 15 percent of the total cost of each training course delivered.

From the beginning, it was considered important to keep outreach training costs low, both to maximize the amount of training that could be funded, and to make it more likely that outreach training could continue after the NWRP ended.

Overhead costs were minimized partly by initially staffing the Outreach Training office with just two persons - a department head and an assistant - and by continuing to hire only in-country private sector experts as design advisers and as temporary trainers. Training space was not for a cost item, as training took place in the workplaces of the participants. Only a relatively small fee, lodging, and transport costs continued to be paid to trainers, as in the pilot stage. The costs of the OTS were not built into water tariffs.

Expansion of the Outreach Training System

As outreach training expanded, the OTS office staff increased to five people, still remarkably small to serve the training needs of 250 towns. To streamline the identification of trainers, a databank of nearly 500 experts was created, based on responses to advertisements in national and local newspapers. The OT Office paid private sector experts just \$US50, well below the industry norm primarily because individuals

and companies regarded participation in a major World Bank-funded project as beneficial exposure. Every new trainer was observed and assessed using a standardized Training Monitor Protocol. Courses were revised in response to an impact-assessment procedure implemented in the workplaces of participants.

By the second year of operation, the OTS office was delivering over 300 trainee-weeks of practical training annually. By the fourth and final year of the project, the figure was 300 trainee-weeks per *month*, including an ambitious 12-week induction course to provide water provision skills to both state and local government engineers.

As courses were designed and implemented, each was added to a regularly updated course list which provided details of each course, including skill acquisition objectives.

Impact Assessment

The OTS office designed questionnaires to assess the impact of delivered training, especially in terms of acquired skills and subsequent use on the job. They were completed by a cross section of trainees three months and six months after delivery of training. An analysis of responses indicated that training was generally effective, and that skills were acquired and practiced. Trainees' rating of effectiveness was a mean of 4.1 out of a possible 5.0. Written comments were also used to help the OTS office to make adjustments to the design and delivery of courses.

One of the outcomes of the assessment concerned the use of acquired skills on the job. Trainee responses, and follow-up inquiries by the OTS office, indicated that operatives felt that although they had gained skills through the training, and most were able to implement their newly acquired skills, some participants' use of the skills on the job was frustrated by shortage of specialized tools, and lack of sufficient spare parts to carry out repairs. This information was passed on to the water provider managers.

Incentives and roles

Virtually all the water offices of the participating towns operated at a loss as water was regarded by the public as a social service and income was normally considered insufficient to meet the costs of provision⁶. The OTS was seen as a cost-effective means of improving services – to increase the amount of delivered water, reduce the level of unaccounted for water, and raise the efficiency of tariff collection.

The World Bank/IDA supported the OTS to help ensure that the assets provided by the project were properly operated and maintained and the borrower gained maximum benefit from borrowed funds. The role of the World Bank/IDA supervision staff was to oversee and facilitate arrangements for training and to monitor quality, as well as to ensure that the trainee-days delivered were adequate to provide the support needed by the towns.

⁶ The FMWR provided subsidies (“subventions”) to state water agencies and to towns

The FMWR were well aware of shortages of water within the country, and had pushed for water provision assistance. The Ministry supported the OTS when the system's effectiveness was demonstrated, and costs per trainee-week were kept low. After the close of the NWRP, the FMWR continued to provide the same level of financial support to the OTS Office as during the project: the OTS office still delivers outreach training as it did during the NWRP.

Technical Assistance Services

The OTS was designed and delivered to increase the efficiency of water providers by providing task-related skills to a broad range of personnel in technical, finance, and management roles. The primary advantage over traditional training sources such as seminars and courses offered by others was the provision of practical tailor-made training provided within the participants' own work environment, utilizing the resources within that environment.

OTS works well to transfer skills where: the intended beneficiaries have a plan to improve efficiency with clear goals and needs and can afford the costs (which were met by dedicated NWRP funds in the case of Nigeria); participants are carefully chosen; training is "hands on"; and the supervisors of individual participants encourage *use* of newly acquired skills in the workplace.

Challenges and issues

The introduction and implementation of the OTS faced a number of challenges, including:

- Convincing World Bank/IDA⁷ and FMWR officials that a new training paradigm was needed and that the OTS concept was sound and merited funding;
- Overcoming the existing attitude of some officials of the FMWR project office, the state water agencies and town water providers, and some World Bank officials involved with the project that training within projects is largely ineffective and not a sound investment;
- Encouraging the FMWR to dedicate a portion of project funds to training;
- Promotion of the OTS among the state water agencies and towns, especially among some officials who opposed the withholding by the FMWR of five percent of project funds allocated to each agency and the towns it served;
- Ensuring that the managers of state water agencies and town water providers understood the OTS concept and how to access training, and would support the use of acquired skills in the workplace;
- Convincing FMWR that the money to support each training activity be sent in trust to the hosting town (through the state water agency);
- Locating private sector experts;
- Ensuring quality while keeping costs low;
- Designing a simple and valid impact assessment instrument;
- Helping to ensure sustainability.

⁷ The NWRP team leader was supportive of the OTS concept from the earliest design stage.

Advantages and Limitations

Major advantages of the OTS over traditional training programs relying on third party training are:

- Collaboration among federal, state, and local governments;
- In-house control of design, implementation and assessment;
- Use of private sector experts as training design consultants and as trainers;
- Specific targeting of beneficiaries' identified needs;
- Access to training on demand;
- Cost-effectiveness;
- Delivery of practical training within the work environment of participants.

The major restraints in terms of replication are:

- Creating a willingness of decision-makers to a new training paradigm;
- Convincing decision-makers of the merit of the OTS concept;
- Absence, or shortage, of suitably skilled private sector experts (especially in very poor nations);
- Inability of trainees to utilize skills due to absence of needed resources within their workplace.

Applicability of OTS in Towns

As training delivered by OTS is designed to meet specific needs, the system can be used – and has been used – in both large municipalities and small towns to address needs from maintenance of diesel electric pumping stations to routine repair of village hand pumps, and from computerized accounting training to sessions on basic bookkeeping.

A constraint on use of OTS in small towns may be setting up a procedure to locate experts, and finding the funds to pay the relatively modest cost per trainee. The possible absence of experts in a small town was overcome during the NWRP by drawing them from the entire country.

Transfer of Concept to Ethiopia and Ghana

The success of NWRP outreach training model has led to its use in other projects with large capacity-building components, namely the Ethiopian Water Supply Project, and the Ghana Urban 5 Project. In each case, it has been possible to locate experts willing to work below their normal fee rates, because of the status gained from being associated with a high-profile project.

The model was adjusted in Ethiopia in the sense that formal classroom training for senior managers and finance officers were held at a central public training college under contract to the project (it is inefficient to provide training in the learner's workplace where the numbers at each workplace are less than three). The instructor was hired by the project to control the quality of instruction. The classroom training was followed up by "coaching" visits by the contracted instructor to the workplaces of the learners to deliver follow-up help in implementation of acquired skills.

Annex 1: Key stakeholders

<i>Stakeholder</i>	<i>Role</i>	<i>Responsibility</i>
Federal Ministry of Water Resources (FMWR)	Representative of the borrower, the Government of Nigeria	To implement NWRP on behalf of Government of Nigeria
National Water Resources Institute	Location for OTS office	Accommodate and supervise OTS office
State water agencies	Support provision of water to towns within each state	Liaise with NWRP project office on behalf of towns: request and facilitate OTS training
Town water providers	Provide water to participating towns	Support improvement of water provision, arrange for training through state water agencies, host training.
NWRP Project Office	Supervise day-to-day activities of NWRP on behalf of FMWR	Ensure training is provided to states and towns
OTS office	Develop and deliver OTS training	Ensure training needs are met through needs-specific competency-based training
IDA/NWRP project supervision team	Representative of lender	Supervise design and delivery of training, ensure quality
IDA/NWRP training consultant	Designer of OTS	Oversee design and delivery of training, ensure quality, carry out routine supervision and assessment of OTS, liaise with stakeholders, report to IDA

Annex 2: Rating of OTS in terms of its potential and actual effectiveness in providing training in selected specialist services.

	Specialist Services	Rating from zero to five (five is the highest rating)	Reasons
Financial	Financial management training	5	Provided by OTS during NWRP
	Business planning	3	
	Tariff setting	3	
	Customer relations	5	Provided by OTS during NWRP
	Access to finance	n/a	
Technical	Technical training	5	Provided by OTS during NWRP
	Expansion planning	4	
	Problem solving	4	
	Efficiency improvement	4	
Other	Procurement services	5	Provided by OTS in Ghana urban development project
	Regulation		
	Construction management	5	Provided by OTS in Ghana urban development project
	Water provision skills	5	Provided by OTS during NWRP

Annex 3: The Training Courses

Training delivered – and still being delivered - by outreach training included/includes:

- preventive maintenance;
- diesel electric generator maintenance;
- generator maintenance;
- basic electrical fault finding and repair;
- electrical installation;
- submersible electric pump repair and maintenance;
- hand pump operation and maintenance;
- pump design and installation;
- borehole maintenance;
- leak detection and repair;
- meter reading and reader supervision;
- repair of meters;
- valve repair;
- basic motor vehicle maintenance;
- pipe network maintenance;
- water quality testing and control;
- bookkeeping;
- word-processing;
- billing and collection;
- customer relations and marketing;
- customer enumeration;
- personnel management;

Annex 4: Measurement of Impact of Training

To help monitor the quality of training delivered, a simple Impact of Training Study was implemented in 25 percent of the courses delivered during the NWRP. The impact questionnaire was completed by trainees three months and six months after training. A Likert scale was provided for each question. Questions concerned: perceived acquisition or strengthening of skills; the relationship of training objectives to the participants' responsibilities; and elements within the workplace promoting or hindering use of acquired skills on the job.

The questions were:

1. To what extent did you understand the objectives of training prior to the start of the course?
2. To what extent do you feel the course was delivered in a way to provide you with skills?
3. To what extent do you feel you acquired all of the skills taught during the course you attended?
4. To what extent did you learn each of the following skills?
(a separate list of ten to fifteen skills to be acquired at each course was developed in order to gather course-specific data)
5. To what extent do you feel you strengthened your existing skills?
6. To what extent do you feel you acquired new skills?
7. To what extent was the training related to your responsibilities on the job?
8. To what extent do feel the training was practical enough?
9. To what extent have you been able to use your new or improved skills on the job?
(following these questions was a group of questions probing the extent to which each of a number of factors made it possible or difficult to use new or improved skills on the job).

Town Water Supply
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**Apex Project Management and Technical
Assistance**
The Example of Eesti Veevärk

Companion Paper C2

Solveig Nordström, NEFCO
Klas Ringskog
June 2003

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Companion Paper C2: Apex Project Management and Technical Assistance

The Example of Eesti Veevärk (Estonian Water Company)

Solveig Nordström, Nordic Environment Finance Corporation (NEFCO)

Klas Ringskog

June 2003

Introduction

Individual municipalities can rarely attract and retain the specialized administrative, financial and technical staff needed to develop and sustain a successful water and sanitation system. An apex institution offers a potential solution. Specialist skills, financial credibility and purchasing power can be developed in the apex institution and the benefits channeled to its participating agencies. In-house capacity of the individual agencies may then be limited to the resources needed for routine operation and maintenance, with more advanced requirements for financing new works, procuring equipment and spares, or responding to major system failures being contracted to the apex body.

Eesti Veevärk (Estonian Water Company) is an example of an apex institution serving municipalities throughout the Republic of Estonia. It proved successful in the early years after independence, when the financing role was especially important, but there are doubts about the longer-term validity of the model, as the paper explains.

Historical context

On August 20, 1991 the Republic of Estonia regained the independence that it had lost in 1940 to the Soviet Union. Estonia has an area of 45,000 km² and a population of 1.5 million of which 72% is considered urban. Per capita GNP was US\$ 3,870 in 2001 and the pre-independence command economy has now successfully been restructured to a market economy. The economic transformation followed a political transformation where, among other changes, the water supply and wastewater state enterprise *Eesti Vesi* that had centralized decisions in the sector was liquidated in 1995. In order to fill the gap after *Eesti Vesi* a new private company, *Eesti Veevärk*, was established in 1993 to serve as an apex institution for its municipal owners offering professional services related to investment activities and operations and maintenance.

The rationale was the conviction that small individual municipalities would not be in the position to attract and retain specialized professional staff needed in the modernization of the country's water supply and wastewater sector. The objective was a division of responsibility where routine operations and maintenance would be managed by municipalities but specialized expertise would be housed in *Eesti Veevärk*. Municipalities would jointly own *Eesti Veevärk* but would buy professional services on terms that

would permit Eesti Veevärk to attain financial and legal autonomy. The arrangement was intended to facilitate the external financial and technical assistance that Estonia sought from the European Bank for Reconstruction and Development (EBRD), the Nordic Environment Finance Corporation (NEFCO), and other institutions and private companies.

Eesti Veevärk was established as a share corporation to allow it legal autonomy and give it clear rules for governance. The salient features of its statute are included as an Annex. Given the small size of the country, Eesti Veevärk was established with a headquarters office in Tallinn and without any branch offices.

Ownership, Oversight and Operations

Eesti Veevärk was originally established by Eesti Vesi and the country's second-largest water company, the Tartu Water Company. It is owned by the individual municipalities (later transferred to the municipalities' water companies) that expect to require its professional services. Municipalities are free to purchase as many shares as are available, but in practice ownership is based on each municipality's share of the later liquidated Eesti Vesi. This structure led to the larger Estonian municipalities (excluding the capital city Tallinn) owning the majority of shares as Table C2.1 indicates. It is worth noting that municipalities remained as shareholders of Eesti Veevärk even without benefiting from the external project financing from EBRD and NEFCO, for which many of Eesti Veevärk's services would prove particularly valuable.

Ownership has fluctuated over the years with certain municipalities acquiring more shares for their water company in order to gain a greater say in the operations of Eesti Veevärk. The initial capitalization of Eesti Veevärk was set at about US\$ 30,000 so as to enable all municipalities to participate as owners and increase transparency. The original number of owner municipalities was 29 of which four were major share owners (NEFCO also held 11% of the shares):

Table C2.1 Shares of Ownership of Eesti Veevärk , 1997

Owner Municipality	Share of Ownership	Participation in External Project Financing
Narva	14%	Yes
Tartu	13%	Yes
Kohtla-Järve	11%	No
NEFCO	11%	Not applicable
Pärnu	10%	Yes
Kuressaare	5%	Yes
Valga	3%	No
Others	33%	Yes/No
Total	100%	64% No, 36% Yes

Eesti Veevärk's statutes reflect the modern governance of a privately owned share corporation where the objective is to operate efficiently and generate profits for its owners. The highest level of oversight is from the General Assembly (GA) of shareholders. The GA instructs the Board, which in turn lays down policies and strategies for the Managing Director and his staff. The modern governance no doubt was motivated partly as a reaction against the centralized management models of the former Soviet Union, and partly by the desire to modernize in preparation for the country's future entry into the European Union. The fact that, as of 1998, all municipal water supply and wastewater activities must be managed as limited share corporations also provided a natural fit with organizing Eesti Veevärk as a share corporation.

The key concept of Eesti Veevärk is that it is cheaper and more feasible to gather and develop specialized administrative, financial and technical expertise in an apex institution rather than attempt to build up such capacity within each municipality. This objective is clearly spelt out in section 1.3 in the Statutes (See Annex). A second concept required Eesti Veevärk to serve as a financial apex borrower through which external financing from EBRD and NEFCO could be channeled to the ultimate municipal borrowers. A third was to use Eesti Veevärk as an economical way of buying spare parts and equipment on behalf of its municipal owners, to obtain larger quantities and better prices. The main promoters of Eesti Veevärk were thus individual municipalities and the funding agencies initially with only a minor role for the individual communities. As a consequence of the legal requirement to incorporate municipal water supply and wastewater services the influence of the municipalities waned and that of individual water supply and wastewater companies grew commensurately. In particular, the Tartu water supply and wastewater company has become the main driver of Eesti Veevärk's future direction.

Financing

Financing of current and capital costs in the Estonian water supply and wastewater sector is assumed to be from a mixture of loans and official grants, primarily from the European Union and its associated institutions. Consumers are supposed to pay the full costs of service, including interest and amortization of the loans. Eesti Veevärk can serve as Investment Agent for a given municipality, taking responsibility for planning, designing and implementing an investment project on behalf of the municipality and transferring the assets upon completion to the municipal water supply and wastewater share corporation for operation and maintenance.

In return for its professional specialist services, Eesti Veevärk receives a remuneration intended to cover its entire costs of personnel and operations. In keeping with the free-market philosophy of the sector with its emphasis on users paying for the entire costs, there is no funding from either local or central government. Eesti Veevärk is thus dependent on sufficient market volume to generate the fees and remuneration to pay for its own administrative and personnel costs. It is also dependent on a transparent and open competition for the services as an investment agent. This has proved to be an increasing risk insofar as individual municipalities and municipal water supply and sewerage companies have at times elected to contract with other project management firms or to

manage projects themselves. The latter may always appear attractive to a municipality that wishes to make all the decisions itself related to the procurement of goods and services under investment projects.

Evaluating **Technical Assistance Services Demanded and Provided**

The soundness of the rationale of Eesti Veevärk was validated by its successful role in implementation of the EBRD-funded Small Municipal Environment Program (SMEP) involving 13 individual municipalities. For the later planned Small Municipal Investment Program (SMIP) involving another 17 municipalities, another concept was chosen, whereby a centrally located Project Implementation Unit was set up, buying services from a consultancy company, but without any contracting or financing role. That model has since proved to be less efficient than the SMEP one when Eesti Veevärk fulfilled its intended role as apex institution, and did it successfully, as indicated by the EBRD evaluation of the SMEP.

It proved possible to meet the expected objective as a profitable financial intermediary, as a purveyor of technical/financial/administrative know-how, and as a distribution channel for equipment and spare parts and for training. However, since the beginning of the SMEP implementation different parts of Eesti Veevärk have developed at different paces and by 2002 some original activities had largely been discontinued. In particular, with the growing competition from private firms that supply equipment and spare parts for the water companies Eesti Veevärk chose to discontinue this business line. Similarly, with the institutional development of the individual water supply and wastewater companies, Eesti Veevärk elected to discontinue its training workshops, since their profitability was marginal at best. The three main remaining activities are now project management, technical services (particularly network rehabilitation) and preparing feasibility studies. In all three areas Eesti Veevärk has attempted to export its know-how but so far with limited success. The emerging competitors to Eesti Veevärk in its various activities have been private consulting companies, equipment suppliers and even the water supply and wastewater companies themselves.

Eesti Veevärk has played only a subordinate role in assisting individual water supply and wastewater companies to achieve cost reductions and service improvement strategies, since it has no hierarchical relationship with the municipal companies and indeed is competing for assignments with the same companies. In its capacity as a project management company employed by individual companies, Eesti Veevärk can advise on how to increase water sales and expand system capacity, but such assistance is not requested on a routine basis. However, Eesti Veevärk was crucial in enabling small municipalities to access external financing and through its proven ability has made such small borrowers credible in the eyes of external lenders. By the same token, it can be surmised that the successful experience of Eesti Veevärk will be of value for municipalities in channeling grant funds following Estonia's membership of the European Union. Eesti Veevärk has not played a major role in facilitating partnerships and contracts between individual municipalities, since by doing so it would duplicate the TA capacity that it itself possesses.

The rapid and successful creation of a professional apex institution in the relatively short time period of five years was most of all due to the strong will of the Estonian government and of Eesti Veevärk to modernize. However, both were supported by substantial external technical assistance. First, there was a four-year twinning program with the Oslo Water and Sewerage Works (OWSW) in Norway on a grant basis. The twinning arrangement was provided to Eesti Veevärk and participating municipalities and had a number of objectives:

- ✓ To develop Eesti Veevärk into an efficient and self-financing company;
- ✓ To ensure efficient implementation of externally financed investments;
- ✓ To improve the management, operation and maintenance performance;
- ✓ To improve the planning, design and construction of minor system expansions; and
- ✓ To improve the rehabilitation and repairs in the participating municipalities' waterworks.

In the opinion of Eesti Veevärk, the OWSW twinning program was not as responsive to the real needs as the preliminary technical assistance provided by a Norwegian consulting firm, Norconsult.

Second, the technical assistance program from the European Union (PHARE) was tapped to improve the productivity and efficiency of municipal services in the participating municipalities. The grant-financed program focused on improving the financial management and business management. The main program was to improve accounting, billing and revenue collection. Third, Eesti Veevärk benefited from having NEFCO as an external owner of shares and a lender, and from NEFCO's seat on its Board. And fourth, through the EBRD financing of ECU 10.2 million as part of the SMEP investment of ECU 46.8 million, Eesti Veevärk also received continuous technical advice on how to build up and apply its technical and financial know-how. The combined effect of the Norwegian support, the PHARE assistance and the continuous advice from the NEFCO Board member and from the EBRD financing was highly beneficial and was unusual in its breadth and scope.

In keeping with its objectives of functioning in accordance with the principles of a free market, Eesti Veevärk developed explicit contracts under which it is providing its services to individual municipalities. The contracts are quite voluminous and specific to the particular services offered. They have been important for establishing clear accountability of Eesti Veevärk as a provider of professional services, which is important because its main employers – the municipal water supply and wastewater operators – are also its main owners.

Eesti Veevärk is set up as an autonomous share corporation, accountable to its shareholders, i.e. its municipal owners. The ownership has changed from being fairly dispersed with about 30 owners to one in which the largest municipality (Tartu) has now acquired a majority shareholding. The municipal owners tended to consider their equity

in Eesti Veevärk as an investment like any other. They were therefore perfectly willing to sell off their respective shares when they perceived that the share appreciation had met their expectations and that their reason for owning shares in Eesti Veevärk had been accomplished through completion of the SMEP.

The municipal water supply and wastewater share corporations are the historical and natural clients for the services of Eesti Veevärk. They are willing to contract for technical and financial services from Eesti Veevärk only so long as Eesti Veevärk can supply these at competitive prices. The competitive situation has become increasingly keen because the Estonian economy has progressed and diversified and become more sophisticated with a greater number of firms competing for the market in each segment

Replicability in Developing Countries

The situation in most developing countries is quite different from Estonia. High demographic growth and lagging service levels mean that investment needs are large. Many of these countries also lack trained staff that could handle the range of aspects of the project cycle. For these reasons an apex institution like Eesti Veevärk could well be beneficial in many developing countries. Indeed, the prevailing model in many developing countries in the 1970s and the 1980s was national apex institutions that handled all aspects of the cycle of water supply and sanitation projects, including operation and maintenance. One of the reasons offered was the advantage of being able to use scarce staff optimally.

The innovation of Eesti Veevärk is to clearly separate functions that small-town local operators cannot perform cost-effectively and leave the rest to the municipal operators. Another innovation has been a conscious effort to keep competitive pressures on Eesti Veevärk by not according it an exclusive role as investment agent. Such an earmarking of functions could rapidly be abused by Eesti Veevärk. The choice of governance model – a share corporation subject to full competitive pressure – is also symptomatic of the wishes of the Estonian government to allow Eesti Veevärk a role only so long as it offers competitive advantages.

An apex technical assistance and project management institution such as Eesti Veevärk can make its most important contribution in a stage of rapid expansion of a country's sector where the investment volume is substantial. Its contribution will be less in a mature sector where the municipal water supply and wastewater operators need to invest less and where they have acquired the necessary know-how as to how to plan, design, implement and operate and maintain their systems. This situation seems to have presented itself in Estonia and it is an open question if Eesti Veevärk will be able to continue playing the important role that it did in the 1990s. Even if it develops into a fully fledged consulting engineering company with special expertise in the water sector, it cannot provide financing of its own for investments since it only was an intermediary investment agent in the past. Even if it did have investment funding it would be hard-pressed to compete against the expected flow of highly concessionary funding that is expected when Estonia joins the European Union in 2004.

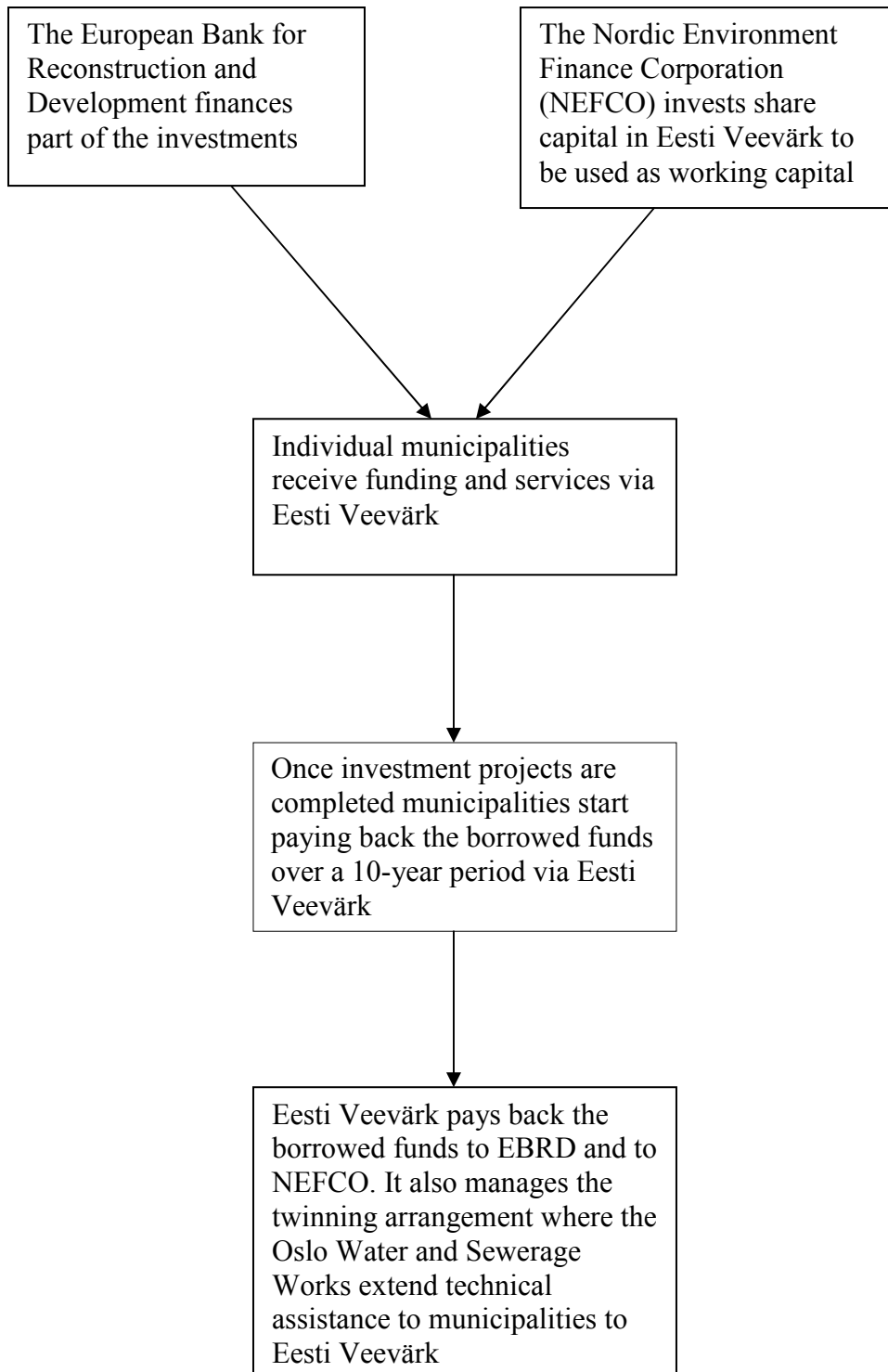
RATINGS OF MODEL IN PROVIDING SPECIALIST SERVICES

Eesti Veevõrk has been rated in the table below in terms of its effectiveness in providing professional services in different areas of interest in the development of the country's water supply and wastewater sector:

	Specialist Services	Rating from zero to five (five is the highest rating)	Reasons
Financial	Financial management training	3	This was not felt to be a major need in Estonia
	Business planning	4	The municipalities and the individual municipal water supply and wastewater companies counted on assistance from the EBRD and NEFCO in planning their businesses. In turn, the two financiers used Eesti Veevõrk as the conduit for this type of assistance.
	Tariff setting	3	This was not a major area of contention in Estonia, given the government's unequivocal decision to require users to pay the full costs of services
	Customer relations	2	Not a major felt need
	Access to finance	5	Eesti Veevõrk was crucial for obtaining external financing and implementing the financed projects
Technical	Technical training	4	This type of training was more important in the early years and has now receded as a priority
	Expansion planning	4	Ditto
	Problem solving	4	Ditto
	Efficiency improvement	3	This was not a major priority

Other	Procurement services	5	Eesti Veevärk was key for the successful implementation of externally funded projects
	Regulation	1	Eesti Veevärk played no role in regulation
	Construction management	5	Eesti Veevärk was key for the successful implementation of externally funded projects
	Other	3	Eesti Veevärk had good business in water supply and wastewater equipment in the early years of independence but has since closed this activity as it is now handled by private business firms.

Diagram of the Small Municipalities Environmental Program (SMEP)



Key Stakeholders, Roles and Responsibilities

Municipality	Estonian municipalities are obliged by law to manage their water supply and wastewater operations through share corporations with the objectives of efficiency and financial autonomy.
Investment agent	Eesti Veevärk has acted as an investment agent on behalf of municipalities that have requested external financing of their investment programs. The investment agent (i) applies for the external loans; (ii) prepares financing plans to implement investment projects, including specifying how large the municipal contributions must be; (iii) prepares an implementation plan of the project on behalf of each participating municipality; (iv) manages project implementation; (v) transfers the fixed assets to the municipality on completion of the investment project; and (vi) ensures that a separate company has been set up to operate and maintain the assets.
Regulators	The quality regulation is usually carried out by the Ministry of Health regarding the adequacy and safety of the drinking water supplied, and by the Ministry of the Environment regarding the compliance with effluent standards. There does not seem to be a separate economic regulation of the tariffs. These are the responsibility of the municipal councils who approve tariffs on the basis of requests from the separate water supply and wastewater share companies.
Consumers	Are obliged to sign a special connection contract with their respective municipal service provider. All consumption must be metered and the consumer must pay the full costs of water supply services, including operations and maintenance costs, and the costs of depreciation and other financial charges. (In practice this objective has not been fully met.)

Recommended Literature

Small Municipalities Environment Project (SMEP) – Completion Report of European Bank for Reconstruction and Development, 2001

Annex

Statutes of the Joint-Stock Company “Eesti Veevärk” dated May 13, 1993

(Salient features, not a complete legal record)

1. General Principles.

1.1 The official name of the joint-stock company (called the Company in the text of the Statute) is:

AS Eesti Veevärk

- 1.2 The aim of the activities of the Company is to offer services and develop water and wastewater management for legal and single persons in Estonia
- 1.3 The fields of activities of the Company are the following:
- 1.3.1 provide design, expert advice and project management of new construction activities (including of treatment plants);
 - 1.3.2 build technical facilities, and service, safeguard and rehabilitate the same;
 - 1.3.3 develop and apply new technological facilities and processes;
 - 1.3.4 undertake theoretical and applied research of technical processes and analysis of water and wastewater services;
 - 1.3.5 organize courses of supplementary training;
 - 1.3.6 organize workshops and exhibitions;
 - 1.3.7 undertake commercial activities in the areas contained in these Statutes;
 - 1.3.8 purchase and sell goods and services to legal and physical persons;
 - 1.3.9 provide consulting services;
 - 1.3.10 act as an agency in the areas contained in these Statutes.
- 1.4 The Company may obtain, establish and hire enterprises dealing with the activities in its field, open branch offices and representations in the Republic of Estonia and in other states.
- 1.5 The Company has the right to obtain, hire and expropriate buildings, establishments, facilities, means of transportation, inventory, raw materials and other physical assets.
- 1.6 The Company can organize temporary scientific and hobby clubs and associations.
- 1.7 The relationships between the Company and the state, local authorities and other legal and physical persons should be based on legislation and contracts.
- 1.8 The Company has the right to enter into contracts with citizens, enterprises and banks of foreign countries directly as well as with intermediaries, to develop economic ties with them, be a member of international organizations, establish enterprises with joint capital, and to represent them and their interests on the territory of the Republic of Estonia.
- 1.9 The Company is obliged to act in accordance with the Legislation of the Republic of Estonia, and within the present Statute.

- 1.10 The Company enjoys the rights of a legal person including those of its name, log, trade mark and can manage bank accounts
- 1.11 The Company's legal address is 5 Kadaka Street, EE0006, Tallinn, Estonia.

2. Share capital, shares, rights and obligations of the shareholders

- 2.1 The capital of the Company is 445 000 Estonian crowns. The share capital has been divided into 445 shares each with a value of 100 crowns. With the decision of the General Meeting of the Shareholders it is permitted, without changing the present Statute, to reduce the share capital to 250 000 crowns, which is the minimum of the Company's share capital, or to raise the share capital to 1 000 000 crowns which is the maximum of the capital of the Company.
- 2.2 The Company has only one kind of shares, each with a nominal value of 1000 crowns, which entitles its holder to one vote.
- 2.3 The Company has the right to increase or decrease its share capital in accordance with the official legislation.
- 2.4 The share capital is increased through issuing new shares, where the shareholders have the preference to buy the new shares in relation to the shares they already own, unless the General Meeting decides otherwise. If not all shares are bought by the existing shareholders, the remaining shares will be sold out openly. The order, prices and terms of payment are determined with the corresponding decision of the General Meeting of the shareholders. The General Meeting may decide to permit the payment of shares in the form of materials and assets.
- 2.5 The reduction in share capital can be carried out via buy-back of shares and their subsequent cancellation or by decreasing the nominal value of all shares. The corresponding decision is made by the General Meeting. The decision to reduce the share capital enters into force only after it is recorded by the Tax Authorities.
- 2.6 The procedures of buying and selling of shares
- 2.7 The procedures in case of death of shareholders
- 2.8 The procedures in case of liquidation of shareholders
- 2.9 The recording of sales of shares
- 2.10 The procedures in case of loss of shares
- 2.11 The rights and obligations of shareholders in general terms
- 2.12 The shares can be acquired by both legal and physical persons.
- 2.13 The rights of Shareholders
- 2.14 The obligations of Shareholders.
- 2.15 The procedures for issuing shares
- 2.16 The recording of purchased shares in the share book
- 2.17 The necessary date in the recording of shares in the share book
- 2.18 The public nature of the share book
- 2.19 The necessary information printed on each share

3. General Meeting of the Shareholders

- 3.1 The highest body of the Company is the General Meeting of Shareholders. The General Meetings are regular and extraordinary. The regular General Meeting is for

reading and amending the annual report and budget, distributing income and electing the Board and must be called by the Board within three months after the end of a fiscal year. The General Meeting may elect an Auditor. The extraordinary General Meeting may be called by the Board but may also be called by Shareholders representing at least one tenth of the share capital or may also be called by an Audit Commission. The application of called an Extraordinary , General Meeting must be submitted to the Board in writing, indicating and justifying the questions to be discussed. The Board must decide on calling an Extraordinary Meeting within one month of receiving the application. Invitations to the General Meeting must be sent out in written form, indicating the date, place and agenda of the meeting at least 30 days in advance of the meeting.

3.2 The General Meeting has the right to decide upon all questions related to the activities of the Company including:

- 3.2.1 changing the Statutes of the Company;
 - 3.2.2 amending the annual report and budget and distribution of income;
 - 3.2.3 electing a Board, and Committees for liquidating and auditing the Company;
 - 3.2.4 electing a Managing director
 - 3.2.5 electing officials of the Board and determining their competence;
 - 3.2.6 setting the salaries of the Board, and of the Committees for liquidating and auditing the Company;
 - 3.2.7 setting up special accounts and funds of the Company;
 - 3.2.8 reorganizing and liquidating the Company.
- 3.3 Shareholders who have been elected into the Board have no right to vote in the questions that affect them personally (setting of salaries and dismissals), as well as to be present when their own proposals are discussed.
- 3.4 The General Meeting is opened by the Chairman of the Board, who proposes in the name of the Board the candidates of the Chairman of the meeting, Secretary and members of the Voting Commission, of whom the Secretary must not be a shareholder.
- 3.5 The decisions are made with the plain majority of votes excluding topics 3.2.1 and 3.2.2 of the present Statute, for which two thirds of the votes of the General Meeting are required. The voting procedure of the General Meeting will be decided separately for each topic of the agenda. The voting will be secret only if a shareholder demands it.
- 3.6 The decisions of the General Meeting are obligatory for all shareholders, including for those absent from the meetings.
- 3.7 The proceedings of the General Meeting and the decisions made by it must be recorded. Decisions must be recorded, and the number of votes in favor of them and those against must be indicated. The record must be compiled by the Secretary, elected by the General Meeting. The record must be adjusted with the signatures of two Shareholders.
- 3.8 The General Meeting has the right to make decisions, if at least half of the votes represented by the shares are present.

- 3.9 If the necessary number of votes are not represented on the General Meeting, it should be called once more within 15 days. The second meeting is competent to make decisions even though the minimum necessary share of votes is not there.
- 3.10 Decisions on questions that were not indicated in the invitation to the Meeting, can be made only with the agreement of all voting Shareholders present at the Meeting.
- 3.11 At the General Meeting, a list of Shareholders present should be compiled, where the names of the Shareholders or their representatives and the number of shares in their possession are indicated. The list is added to the record of the General Meeting.

4. Board

- 4.1 The administrative body of the Company is the Board with at least five members, who are elected by the General Meeting and who leads the activities of the Company in between the General Meetings.
- 4.2 The member of the Board must not be a shareholder. The Chairman and deputy Chairman are elected by the members of the Board with a simple majority.
- 4.3 The Board Meeting is called by the Chairman or deputy Chairman and the meeting is recorded.
- 4.4 The Board has the right to make decisions if at least the Chairman or deputy Chairman and two more members are present. The decisions of the Board Meeting are made with simple majority of the votes. If the votes are even, the vote of the Chairman is decisive.
- 4.5 The competence of the Board is determined by the special guideline of the General Meeting. In any case the following is the competence of the Board:
 - 4.5.1 setting general strategy and business plans and ensuring their implementation;
 - 4.5.2 amending the operating budget and supervising its execution;
 - 4.5.3 opening and closing of branch offices of the Company;
 - 4.5.4 entering into contracts with shareholders of the Company;
 - 4.5.5 resolving disagreements between shareholders and transferring them to the Arbitration of the Tallinn Commercial Industrial Board;
 - 4.5.6 taking and giving loans that are larger than 30% of the share capital;
 - 4.5.7 selling properties belonging to the Company;
 - 4.5.8 making scheduled contracts on hiring and renting properties belonging to the Company, if the term is longer than one year;
 - 4.5.9 investing in other properties;
 - 4.5.10 making other contracts, and in so doing accepting financial obligations, larger than 30 % of the share capital, or accepting scheduled obligations for a longer period than one year;
 - 4.5.11 determining the competence of the Managing Director in making contracts with foreign legal entities or physical persons who live permanently abroad and entering into such contracts that are outside the competence of the Managing Director;
 - 4.5.12 signing the employment contract with the Managing Director;

- 4.5.13 approving the candidate of Head Book Keeper as proposed by the Managing Director;
 - 4.5.14 approving the Financial Accounts
 - 4.5.15 submitting the annual report to the General Meeting of the Company. The report is submitted to the General Meeting in the name of the Chairman of the Board.
- 4.6 The contracts or other agreements accepted within the competence of the Board are signed by the Chairman or some other members of the Board with its attorney, If two signatures are necessary, the second one will be provided by the Managing Director.

5. Managing Director of the Company

- 5.1 Conducts the daily operations of the Company;
- 5.2 Resolves the daily economic and financial matters as well as other questions in agreement with the present statute and legislation in force;
- 5.3 Issues written orders and arrangements, and makes other decisions within his competence, employs and dismisses employees of the Company, determines their salaries within the limits of the administrative budget;
- 5.4 Makes and signs contracts, obligations and letters within his competence determined by the Board;
- 5.5 Documents, on the base of which money, good and fixed assets are affecting creditors and accounts of the Company, are signed by the Managing Director and the Head Book-keeper;
- 5.6 The Managing Director is personally responsible to the Board and obliged to report on his activities to the full extent.

6. The reporting, distribution and payment of Dividends

7. The responsibilities, reorganization and liquidation of the Company

**Town Water Supply
and Sanitation Services
Volume 3**

**NGO Technical Assistance Providers in the
USA**

Companion Paper C3

**Stephen Gasteyer, Rural Community Assistance
Program
August 2003**

The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and should not be attributed in any manner to the World Bank, to its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent.

Companion paper C3: NGO Technical Assistance Providers in the USA

Stephen Gasteyer, Rural Community Assistance Program

August 2003

This paper builds on work done by the National Environmental Services Center for the World Bank's Rural and Small Towns WSS Thematic Group on management arrangements in the US, including the local government structure and the role of the National Drinking Water Clearinghouse¹. It is based on extensive field experience of the Rural Community Assistance Program (RCAP), as well as fourteen case studies made available separately.

Introduction

Rural community water systems in the United States are more likely than larger municipal systems to have problems of compliance with Clean Water Act and Safe Drinking Water Act standards and regulations. They are less likely than larger systems to have a sufficient customer base to spread the cost of necessary repairs and upgrades, or to be able to afford highly trained water and sanitation system operators. They often as well lack the social and institutional organization to apply for grants and loans that should be available to them through federal and state programs.

The US Department of Agriculture developed programs to provide technical assistance to rural communities in the early 1970s, as part of the "War on Poverty." The government declared an initiative to vastly improve water, wastewater, and other basic infrastructure. Because of the complexity of managing water systems, a model was developed that provided communities with *technical assistance providers* (TAPs) who could work with communities to build competence for implementing and managing water and wastewater services, much as the cooperative agricultural extension operates for farmers.²

The concept of providing technical assistance to rural communities to develop water capacity emerged over 30 years ago with the establishment of the Virginia Water Demonstration Project. An African American community just outside the small city of Roanoke, Virginia had been systematically deprived of water service even though the Roanoke water lines came very close to the town. While the Roanoke City Council and water board stalled in hooking up the community, residents of the community were living in sub-standard conditions.

The now defunct US Office of Economic Opportunity (OEO) at the Department of Health, Education, and Welfare (HEW) contacted employees of the local Community Action Project (a public-private program designed to help improve economic

¹ See, for instance, Saxena, Sanjay. 2002. Community Water Systems Management: the US Model. A Presentation for IRC: International Water and Sanitation Centre, the Netherlands.
<http://www.irc.nl/manage/manuals/cases/usacs.html>

² For an overview of the cooperative agricultural extension program, see Board on Agriculture NASULGC. 1997. Strategic Directions of the Cooperative Extension System. Washington, DC. USDA. CSREES.
<http://www.reeusda.gov/part/gpra/direct.htm>

opportunities for low income communities)³ and water activists in the area to see if they could work with the community to help it build and run its own water system. With the help of funding from OEO, the project worked with the community to organize a local non-profit entity (NGO) that could receive funding from the federal government to implement the necessary infrastructure. It also carried out training and technical assistance to help the community understand the rules, regulations, and best practices of running a water system. The community successfully established a viable water system and has since leveraged that accomplishment to improve quality of life through improvement of infrastructure.⁴ An operating assumption was that the technical assistance to help communities develop water and sanitation infrastructure would also help them to develop the capacity for broader socio-economic development.⁵

The program was so successful in helping the community to put in a water system that the OEO and US Department of Agriculture (USDA) granted funding to establish *National Water Demonstration Projects* that replicated the process in sites around the US. Individual sites became so numerous that the Federal government asked them to incorporate into regional organizations to save on the administrative and management costs. The regional programs eventually incorporated to form the *Rural Community Assistance Program, Inc. (RCAP)*.

The government also funded additional organizations to provide the services to assist a burgeoning number of rural water systems with the resources, knowledge, and skills to deliver safe and affordable water to rural communities. RCAP helped start the *National Rural Water Association (NRWA)*, to provide more specific assistance to rural water system operators. Congress has also established centers designed to provide information such as the *National Environmental Services Center (NESC)* at West Virginia University, which provides small communities with training and information to ensure better water and wastewater services. Other technology centers were established at universities around the US to provide research and development on technologies for small community water systems. The EPA established *Environmental Finance Centers (EFCN)*, located at universities around the US, to develop tools and trainings for community water systems to help them with financial management. This universe of organizations is designed to ensure that residents of the vast rural areas of the US have access to adequate amounts of good quality water services.⁶

1. *Institutional arrangements:*

Since the days of the National Water Demonstration Project, the technical assistance infrastructure has grown tremendously. There are now two different organizations that

³ See http://www.communityactionpartnership.com/about/about_partnership/fact_sheet.asp.

⁴ Board of Directors: National Demonstration Water Project. 1977. *National Demonstration Water Project: A Sense of Urgency*. Washington, DC: Rural Community Assistance Program.

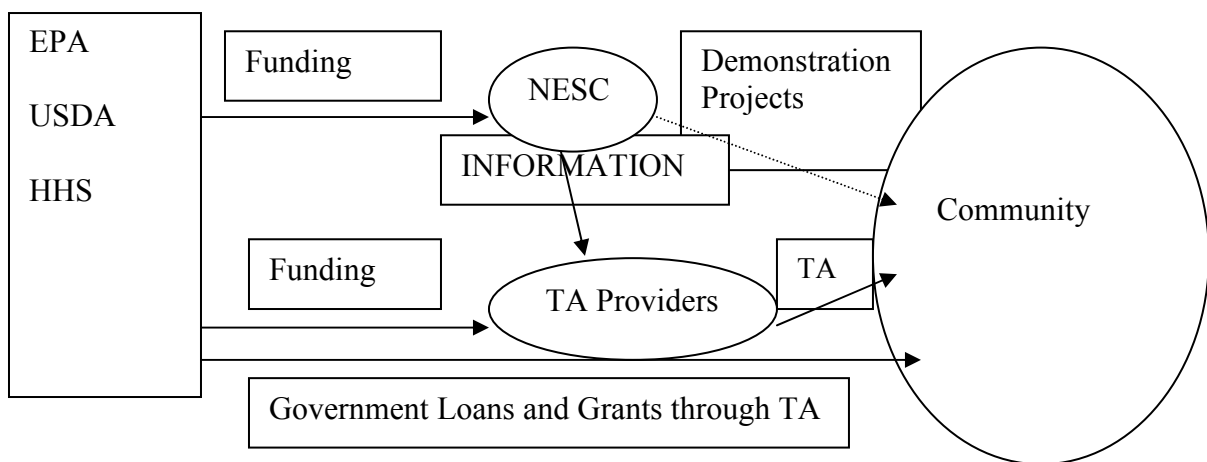
⁵ See Warner, Dennis and Jarir S. Dajani. 1975. *Water and Sewer Development in Rural America*. Lexington, Massachusetts: Lexington Books-DC Heath and Company.

⁶ For more information, see Saxena 2002.

provide technical assistance to community water systems: RCAP and NRWA.⁷ Additionally, the Environmental Protection Agency (EPA) provides training materials to communities on best practices on rules and regulations, and the National Environmental Training Center for Small Communities (NETCSC) and the National Drinking Water Clearinghouse (NDWC), both part of NESC at West Virginia University, produce training materials and demonstrations that aid small communities in water and wastewater management and delivery of services. In addition, university-based training institutes provide technical innovations and training materials for community water systems. Community water systems may additionally receive assistance in issues related to financing from the university-based EFCN.⁸ (See Figure C3.1.)

This infrastructure of TA and training information is funded largely through various offices of the Federal government (usually as a portion of the low-interest loan funds that capitalize infrastructure implementation and improvement in water and wastewater). The NGOs officially compete for funding, though many of the base grants are guaranteed through the Congressional budget allocation process. Portions of the EPA and U.S. Department of Agriculture Rural Development (USDA-RD) funding are generally earmarked by the U.S. Congress to ensure that moneys go to special programs and organizations. Most of the small system TA and information funding for ongoing programs falls into this category. However, as special issues arise, new programs are established, and the TA and information NGOs compete for grants to deliver these programs. For instance, RCAP, NRWA, NESC, and the other organizations listed above competed during 2002-2003 for funding to develop training materials and provide TA to small communities to improve water system security and disaster preparedness.

Figure C3.1: Institutional Model for Delivery of Technical Assistance



⁷ For more information on these two institutions see <http://www.rcap.org>, for RCAP and <http://www.nrwa.org>, for NRWA.

⁸ For more information on NESC see <http://www.nesc.wvu.edu>; for EFCN see <http://www.efcn.unm.edu>.

In short, the TA organization often acts as the intermediary linking the community with government agencies (Federal, State, Regional/County, and Local) and information providers and trainers (NESC and EFCN around improving water and waste management and delivery. While government primacy agencies approach better water and waste management as an end in itself, as an NGO that works on community development, RCAP, inc. recognizes the potential for utilizing community capacity development around water infrastructure options to foster decision-making about community strategic planning, economic, and entrepreneurial development.⁹

Government often uses the TA provider and information providers to help communities achieve compliance with health, safety or capacity standards. The state government primacy (regulatory) agency is the institution responsible for upholding water quality and health standards. Community water systems have to adhere to drinking water standards codified in the US Safe Drinking Water Act of 1973, which was amended in 1986 and 1996 to provide for enforcement at the state/tribal levels. The state agency will often refer RCAP to villages or unincorporated communities that have compliance problems.

While there is some overlap in function, different government-funded TA providers and information providers carry out different functions in providing services to low-income small water systems and communities. Table C3.1 and Table C3.2, below, provide descriptions that help to distinguish between the different functions of these organizations. In theory RCAP and NRWA provide different services to communities. NRWA is more technically oriented, tending to act as circuit riders to work with water operators at the community level providing assistance on the operations and maintenance aspects of work. RCAP tends to work more with communities on planning, financing, administrative management, and oversight. This should provide for collaboration at the community level. For instance, RCAP may help a community with reassessing and raising water rates to pay for additional treatment costs, but may ask the local RWA circuit rider to do a leak detection study to make sure that the community isn't losing money through undelivered treated water.

The institutions do compete for contracts with either Federal or State governments for projects outside their earmark. At the state level, RCAP and the state Rural Water Associations often compete for technical assistance contracts to help communities with implementation of environment, health, and sanitation laws. For instance, the Midwest affiliate of RCAP received state-level grants to work on community assessments of source water protection in North Dakota, while NRWA won that contract in Iowa.¹⁰

The institutions also often collaborate on contracts. In the state of New York, Northeast RCAP and the New York Rural Water Association have a joint contract with the state to

⁹ See separate Case Study 1: Route 12 Corridor, NY. See as well National Demonstration Water Project 1977; Warner and Dajani 1975; Bagi, Faqir. 2002. "Economic Impact of Water/Sewer Facilities on Rural and Urban Communities." *Rural America*, Vol. 17 (4): 44-49.

¹⁰ See, Horsley and Witten, Inc. 2001. Summary of EPA Approved State Source Water Assessment and Protection Programs. Draft Document. Washington, DC: Office of Groundwater and Drinking Water: EPA.

provide TA to communities. NE RCAP’s role is to help rural communities with organization, financial and administrative management and strategic planning. NY RWA’s role is to help with direct TA, such as working with small system operators on leak detection. In many cases, particular Federal and State contracts are determined through the political process, where US Congressional or state legislative committees will specify programs intended for these institutions.

TABLE C3.1.1: TA Organizations That Serve Small Systems

Institution	Function—TA
NRWA	Located in Duncan, Oklahoma, NRWA is a membership organization of small community water systems throughout the US. NRWA has representation through affiliates in each state where they have field staff made up primarily of water engineers and system operators who work directly with small water system operators to improve operations and maintenance. They have contracts from the federal government (USDA) to carry out a circuit-rider program to trouble shoot water system problems through 30-minute visits. They have also had federal and state government contracts to work with small water systems on the development of source water assessment plans (SWAPs) and on source water protection.
RCAP	The network has a central office in Washington, DC, but is made up of institutions in six regions of the US. RCAP works with rural communities and their water system operators helping to develop the capacity to improve water and sanitation access and management. TA providers help communities to organize to decide on and receive funding for installation of water, wastewater, or solid waste systems. TA providers also carry out management, operations, and administrative trainings and technical assistance to improve services, management, and planning.

TABLE C3.1.2: Information Agencies That Serve Small Systems

Institution	Function—Information
EFCN	Located at universities around the US with a rotating headquarters, EFCN institutions carry out research and pilot projects to help communities with financial and asset management of their water system. They have played a key role in helping develop models for financial and asset management and community consolidation to improve source water protection and cost savings through improved economies of scale.
NESC	Located at West Virginia University, NESC publishes magazines and articles on best practices and key issues for small water and sanitation systems. They carry out trainings that attempt to consolidate knowledge by other institutions (specifically those listed above) to improve water and sanitation services. They additionally manage a demonstration project for small wastewater management systems, and carry out pilot projects on small system water and wastewater projects to document new technologies and best management practices (BMPs).

The Rural Community Assistance Program (RCAP) works directly with communities – either working initially with the local government or with “spark plugs.” While RCAP field workers, by necessity, work with the community’s elected officials, they are trained to identify those who are likely to motivate the community to make decisions about solutions to water and wastewater problems, organize, submit grant applications, field bids, oversee installation of infrastructure, and be sure that management is carried out. Often RCAP’s role is to establish a local NGO that can apply for project financing, and help the community see the project through to completion. These NGOs may take several forms:¹¹

- *Public Service District*: This entity is usually made up of elected representatives of the community or population served. It is often established through legislative or local government action. The district has implementation and local taxing authority and is primarily responsible for management of the water, wastewater, energy and other services.
- *Public Utility District*: Effectively the same as a public service district, but may be established through a local extra-jurisdictional process. PUDs are also often established to manage and provide services for an area that encompasses either part of one or more jurisdictions. The PUD is usually made up of a representative board, but has the authority to impose tariffs and fines as well as distribute water and sanitation services.
- *Public Utility Board*: Elected from community members this entity has responsibility for oversight of the water system. This includes fiduciary responsibility, but not regulatory or implementation authority. Generally, the community public utility board (water board) has responsibility over a hired professional water and/or sanitation operator.
- *Stand-alone system/private entity*: This is a private, either for-profit, investor-owned or not-for-profit utility district with a standard for-profit board. The utility district usually has either contracted with the community governing body, or is part of the services structure, as in the case of mobile home parks or home-owners associations. These are not necessarily democratic institutions but rather have a vendor-customer relationship with the community. These entities are more prevalent in very small water systems (500 or fewer connections).¹²
- *Conservation District*: Conservation districts were initially established to promote the value of conserving soil and water to farmers. Today's districts have evolved and their areas of interest and expertise involve almost every area of natural resource conservation imaginable. This includes water and sanitation. While these entities are specifically mandated to provide community residents with information or to help people and communities take care of natural resources, they also occasionally oversee community or even county-wide water and sanitation utilities/services. Conservation districts tend to have one or two professional staff, but are generally run by elected community representatives.

¹¹ Saxena 2002.

¹² EPA. 2002. Community Water System Survey 2000. Washington, DC: EPA Office of Water EPA 815-R-02-005B, <http://www.epa.gov/safewater>

- *Cooperative.* Community water system cooperatives are run by a governing board, but involve a membership payment from each of the customers and allow the customers to vote on major changes in the operating procedures. Often, cooperatives are formed through a community-wide initiative to install or expand a water and sanitation system.

Increasingly, RCAP also assists the community to establish relationships with others in the region surrounding the community who are involved in water issues – both for goals such as source water protection and for regionalization (aggregation) to share costs across utilities and communities. These other communities or hamlets (both incorporated and unincorporated) often have the added benefit of providing water and wastewater to residents who live between the communities. This is particularly important for meeting objectives of improved sanitation and water quality.

Requests for assistance may come from communities directly or through referrals from private sector actors, state government, or national, state, or local offices of the federal government. For instance, RCAP often works with communities that are referred by the state USDA Rural Development officer. USDA Rural Development has a low-interest loan program to assist rural communities in water and wastewater management. There are certain organizational requirements that are necessary for the agency to work with communities. RCAP often helps the community to establish an official organization with non-profit status that can receive government loans and grants. RCAP also assists the community to identify various funding sources. This may include accessing low-interest loans available through the EPA State Revolving Funds (SRFs) that provide loans for water and wastewater systems. The TA provider (either RCAP or NRWA) will then help with the bidding process for contractors to install the water or sanitation system and over time with the process of system management. It is notable that RD small water and sanitation infrastructure loans have a default rate of one tenth of one percent since the program started in the 1970s.¹³ While the Clean Water (wastewater) and Drinking Water State Revolving Fund loan programs to support community water and sanitation infrastructure and standards compliance have only been in existence since the mid 1980s and late-1990s respectively, the default rate for these loans is also extremely low.¹⁴ One could surmise that the presence of TA providers to work with communities on ensuring loan repayment is critical to these high rates of return.

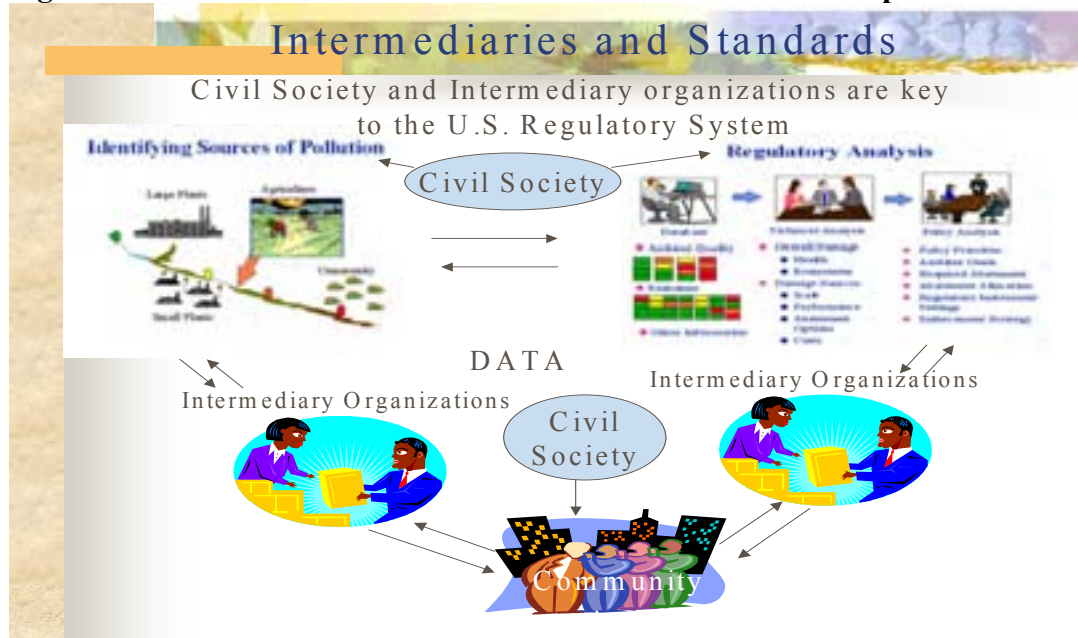
TA providers frequently work with communities indicated by the Regional office of EPA or the state regulatory agency to help communities to come into compliance with drinking water or wastewater regulations. Often, this involves helping the community to

¹³ A total of 47 loans have been written off since the inception of the Water and Environment program, at a total loss to the government of \$20.2 million. The total principle loaned during this period is \$19.4 billion, all but the \$20.2 million has been repaid with interest. Annual Activity Report for the RUS Water and Environment Program, FY 2002. Washington, DC: USDA, Rural Development, Rural Utilities Service.

¹⁴ See EPA. 2003. The Drinking Water State Revolving Fund Program: Financing America's Drinking Water From The Source To The Tap: Report to Congress. Washington, DC: EPA Office of Water: EPA-918-R-03-009. http://www.epa.gov/safewater/dwsrf/pdfs/dwsrf_congressreport-main.pdf.

understand compliance orders and options for achieving compliance. This may involve a series of short visits, hands on work with the community to fix the problem, or longer-term involvement with the community to address political, financial, and administrative hurdles. (See Figure C3.2.)

Figure C3.2: The Role of TA in Health and Environmental Compliance



Other NGOs may also ask TA organizations such as RCAP for assistance in working with communities. For instance, RCAP has collaborated with the Nature Conservancy in helping communities to install wastewater systems that will simultaneously improve quality of life and conserve ecological integrity in the coastal areas of South Carolina.¹⁵ Likewise, RCAP has assisted communities organized by social justice organizations like the Southwest Organizing Project (SWOP) of New Mexico and the Southwest Network for Environmental and Economic Justice (SNEEJ) to identify options in improving their water and wastewater system.

Local representation

TA provider organizations that serve small or low-capacity water and sanitation systems are national in scope, but have a presence at the local level. RCAP, for instance, is made up of six regional institutions, with field representation in 52 states and US territories. This allows RCAP to have a presence throughout all states, but also to be able to coordinate nationally to achieve a given agenda. (See Figure C3.3.) For instance, EPA is able to use the national RCAP and NRW administrative structures for training of trainers to work with small communities on implementation of new health and safety standards.

¹⁵ RCAP has been working for less than a year with the Community Development Council of Seewee to Santee, South Carolina providing that community with alternatives for water and wastewater management.

TA providers work directly with rural communities and tend to live in the area where they primarily work. The scope of work is determined by program directors in each region that coordinate with the national office and with state directors. The national office advises the program directors about reporting requirements for national funders as well as agreed upon objectives, outputs, and tasks. They constantly work with federal government offices to collaborate on key objectives (both within the scope of existing grants and to expand the pool of projects on which RCAP is working). The state directors coordinate both with federal government representatives at the state level, for instance, with the state Rural Development Office, and with the various pertinent state agencies, such as the state department of environment or department of health.

Table C3.1.3: How Communities are Referred to the TA Institution

Contact Organization	Role in Working with Communities	Perceived Role for TA Institution
USDA State Rural Development	Has an allocated amount of low interest loans/grants to distribute to communities for water and sanitation infrastructure.	TA role is to organize communities to apply for loan/grant funding to support water and sanitation infrastructure.
State Primacy Agency—State Department of Health/Department of Environment	Interested in maintaining compliance with environmental and health regulations.	TA role is to work with communities to improve capacity and ensure compliance with environmental/health regulations.
Environmental Conservation NGOs	Interested in working with communities to protect natural resources.	TA role is to help communities to understand options for environmental infrastructure and resources for implementing those options.
Social Justice NGOs	Interested in empowering disadvantaged communities and improving quality of life.	TA role is to work with communities to help them access resources and understand options in infrastructure development to improve quality of life.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/ss4904a1.htm>

Figure C3.3: Map of RCAP Regions



2. Financing

TA in the US is funded through multiple means:¹⁶

- As a percentage of the USDA RD Rural Utilities Service (RUS) loans and grants for community infrastructure;
- Through USDA RD RUS loans and grants to help communities to develop the institutional and infrastructural capacity in addressing solid waste issues;
- Through grants from US EPA to help communities to achieve compliance with Safe Drinking Water Act Rules and Regulations;
- From US EPA to help communities to achieve compliance with Clean Water Act regulations and to upgrade capacity on wastewater and sanitation issues;
- From the US Department of Health and Human Services (HHS) Office of Community Services (OCS) to help build community capacity for decision making, management and implementation capacity to improve quality of life through infrastructure development in low-income rural communities.
- Through grants at the state level to help communities with various aspects of water and wastewater management.
- Through regional grants from federal agencies to provide TA to communities on issues ranging from water, to waste, to housing, to strategic planning.
- Through regional grants from foundations to support RCAP, NRWA, EFCN, NDWC, or other TA or information provider pilot studies or activities at the community level.

¹⁶ See the web site of the USDA Rural Utilities Service: <http://www.usda.gov/rd/rus>

RCAP's services to communities are free of charge, which eliminates conflict of interest regarding advice given. However, to receive advice, communities need to meet certain standards in terms of low-income status and population. Communities that exceed those required (e.g. they are more wealthy or populous than the requirements for free TA) occasionally contract directly with a regional RCAP office for service. RCAP's work in the community is also not limited by ability of the community to pay. Thus, advice can be given through long-term interaction with the community.

It is important to note that the NRWA is a membership organization and provides TA and other services to member rural communities (often slightly larger and wealthier than the communities RCAP works with) who pay membership dues. EPA and USDA contract with NRWA to provide free TA to smaller rural communities. While RCAP works with the community to build community-level capacity, NRWA more typically works with water system operators and provides direct technical assistance.

Services provided by EFCN, NDWC, and the other TA providers are generally free of charge. The institutions often have cost-recovery charges for training materials.

3. Drivers for the NGO TA model

The following actors could drive the decision to provide TA to a community, depending on the particular circumstances of a case:

- a. the community,
- b. the local government,
- c. funding agencies,
- d. the NGO, and
- e. other stakeholders.

Communities often ask the TA providers directly for assistance to help them address a particular problem. They may do this by contacting the national, regional, state, or local office of the TA provider. Communities frequently want to address immediate concerns – for instance inadequate water supply, failing wastewater systems, problems with solid waste management, or a regulatory notice arising from these problems. The challenge for the TA provider in this instance is to make sure that the real problem is addressed, identified, and resolved, and that this occasion be used as a striking moment to build better local organizational capacity at the community level to work on these issues in the future.

The ***local government*** may decide that it is in its interest to have TA providers assist the community. There are two reasons. First, it gives the local government an outside expert to provide advice and take pressure when that advice is unpopular – for instance when a rate increase is needed to keep a local utility solvent. The local government may also not feel that it has the jurisdiction to deal with the community in question, as would often be the case with neighboring unincorporated low-income communities. In this case, TA providers can help the unincorporated community to organize into an entity, such as a local NGO, that can receive funding to help fix the problem.

In cases where the community or the local government have asked for support from TA providers, they probably see technical aid as the opportunity for help in finding resources to address particular issues, such as fixing failing septic tanks or finding water sources. They are likely too to see working with the TA provider as a way of forestalling regulations that could be visited upon them if they do not resolve these issues.

Funding agencies drive the TA process in two ways. First, they often rely on the TA organizations to work with communities that they identify as potential recipients of government-subsidized loans and grants. The USDA RUS RD officers at state level have targets for the amount of money that they are meant to distribute on an annual basis. The funding agency counts on TA providers to organize communities so they are capable and legally able to apply for and manage loans and grants. The other major funding agency for small water systems is the EPA, which, with the so-called “State Revolving Fund” (SRF), passes low-interest loans through the states to finance water system improvements. EPA encourages regional and state agencies to refer small communities that have fallen out of compliance with health and environmental regulations and standards to the TA providers. The TA providers are called upon to work with the community to help bring it into compliance with standards rather than having sanctions imposed. Often the TA provider will help the community to access SRF or other EPA funds to come back into compliance with drinking water standards.

NGOs may drive the TA process by referring communities to the TA provider for specific advice on infrastructure development. For instance, in South Carolina, the Nature Conservancy referred a small community to RCAP to help in the development of an alternative wastewater system that would simultaneously serve environmental conservation and community development goals. An NGO may also organize the community to ask for assistance in water or wastewater implementation.

There are frequently **other stakeholders**, such as engineering firms, that play a key role in this process. Local engineering firms often ask the community to request assistance from RCAP or NRW to help in securing the funds for infrastructure development or improvements. RCAP, for instance, can assist the community in identifying government funding sources for which they may be eligible. The TA provider will then also work with the community to evaluate project needs and options. Occasionally this has led to conflicts between private engineering firms and the TA provider, especially when the TA provider advises the community of more reasonable design or contract options not associated with the firm. Engineering firms are paid a percentage of the cost of the contract. A smaller contract means less money for the firm.

4. TA services demanded and provided

TA providers work with communities on the basis of what the communities request and needs that are assessed on the visit to the community. For instance, a community may ask for assistance with administrative issues because the utility is losing money. The TA provider may suggest that the community carry out leak detection to make sure that the utility is not having financial problems because of excessive water loss – an issue of construction and maintenance. Likewise, RCAP TA providers frequently help

communities that request assistance with system expansion. Often community water systems need to be expanded because of population growth or increased demand to support economic development. Before helping communities to raise the funding and hire the engineering to support this expansion, TA providers also help with planning to make sure that system expansion will meet the needs.

TAPs also work with communities on service improvement (business planning) strategies. Communities often request these services in response to growth or concern about growth – for instance in assessing whether they have the water service to support proposed business development. This kind of service may also be requested when a community loses an industry or business that was a major customer of the water system. TAPs can play a role in either case in helping the community and the water provider to think through technical, administrative, regulatory, and financing options. (See the case of Dearborn, MO, in Case Study # 12.)

Table C3.5.1: How TAPs Work with Communities on Construction (efficiency) Issues

Conditions for Working on Construction (efficiency) Issues	Manner of Working with Communities
1) When there is a need for system expansion	The TAP works with the community on assessment of need for the expansion, on improving whole system efficiency and operations (known as optimization), assessing construction options to expand the system, and helping to access funding or raise the resources, put the expansion project out for bid to engineering firms, assess the bids, and hire the firm.
2) Where there are capacity issues	The TAP works with the community to assess the reasons for the lack of water capacity to meet community needs. The TAP will then work to develop a solution – often digging a new well or developing another source of water that will boost capacity. This will require accessing government or local funds, hiring a well-digging or engineering firm, and overseeing construction.
3) When there are problems in complying with health and safety standards.	Often health and safety problems will necessitate building additional treatment facilities. For instance, high fluoride or arsenic levels will require installation of a reverse osmosis (RO) plant. The process is similar to the steps in the table cells above: providing the community with information for a decision about an appropriate technology; development

	of proposal and background study to access government funding (loan/grant); and helping the community to request and assess proposals by engineering-construction firms and with construction oversight. (See example of Gila Bend, AZ, Case Study # 3)
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TAPs work with communities and utilities to increase water sales and expand the system when there are significant parts of the community or neighboring communities that are not receiving service. This may be the case in water, as is exemplified through the case study of Castleton, Massachusetts (Case Study #13). It may also apply in wastewater service, as is exemplified in the case of Farmington, Maine (Case Study #14). The TA could also assist in expanding service and sales to help make a community system more viable, as in a case where a community has lost revenue, for instance from a closed business or abandoned houses.

The Alexandria Bay, NY Case Study (Case Study #1) demonstrates how water/wastewater technical assistance relates to participatory strategic planning and socio-economic development. The TAP may work with the community, using the need for water/wastewater infrastructure improvement to think through a participatory regional strategic plan. As in the case of Alexandria Bay (Case Study #1), the TAP can use water quality and health regulations to force discussions among leaders of formerly contentious small communities. These discussions may lead to mapping areas and laying out business and residential zones to direct economic and residential growth. These designations could then be codified through the wastewater and water system design, and in turn used to attract government economic development and private sector investment.

A key part of what RCAP does is to help communities to access financing. In numerous case studies (separate document), RCAP TAPs have worked with communities on accessing financing for infrastructure development. Key parts of this process are:

1. Determining what issues the community wants/needs to address;
2. Carrying out income and population surveys to determine eligibility for particular programs;
3. Researching particular funding options, such as the applicability of Community Development Block Grant (CDBG) funding for small cities, or Indian Health Service (HIS) funding for tribal communities (See Santa Domingo, Case Study #5);
4. Introducing the community to policy and political leaders to encourage flows of resources through that process (See Woodland Village, Case Study #11).
5. Helping the community to understand and fill out applications for various resources and to understand and meet reporting requirements and deadlines related to the funding requirement.

The TA NGO plays a key role as a facilitator of partnerships and contracts. The TAP can help communities to develop inter-community cooperative or reciprocal contracts (for purchasing equipment, sharing resources, providing emergency resources). The case

studies of Castleton, MA (Case Study #13), Dearborn, MO (Case Study #12), and Mayes County, Oklahoma (Case Study #8) demonstrate that this can take several forms. Regionalization (aggregation) is increasingly seen as an option for communities to meet environmental, health and safety, capacity, and security and terrorism readiness requirements. Often, the TAP help communities to overcome longtime rivalries or other issues that impede such collaboration. Through the development of formal contracts, and establishing formal processes of interaction, resolving rivalries may yield joint efforts at source water protection or economic development.

The TAP can play a big part in helping communities to advertise and assess contracting bids. Components of this include:

1. Helping the community to develop the initial plans for the project.
2. The TAP in some cases will help (or facilitate) the preliminary and environmental engineering assessments/reports that are required to receive funding for the project. In some cases, RCAP will provide seed funding to support these activities through revolving loan funds run through its regional offices.
3. The TAP may then help the community in actually designing the request inviting proposals for the project.
4. The TAP often will help to evaluate proposals to make sure that they are appropriate for what is needed.
5. The TAP will often check on construction from time to time to make sure that the contractor is staying on schedule and following recommended standards.

TAPs can play facilitate dispute resolution within the community. For example in the case of Food Tree, WI (Case Study #14), the RCAP TAP has been called upon to provide key information to help resolve legal problems among residents over pollution of the water supply. The TAP may also play a critical role between the community and outside people/groups/agencies. The case of Hopeville, Arizona (Case Study #6) demonstrates another critical role of TA providers. In this case, the TAP performed the role of liaison between the community and outside groups who wanted to make an offer on the community water system, and between the community and the Arizona Department of Natural Resources (DNR) and Department of Health (DEH), who were receiving pressure to crack down on violations of water standards. The relationship to the primacy agency is a critical part of RCAP's work.

5. Implementation

The TA model in the US comes out of a commitment by the government to provide support for all communities that want water and wastewater in the US, Virgin Islands, and Puerto Rico. This includes support for Tribal (American Indian) and Aboriginal (Alaskan Native) communities. Many of the TA and information organizations that exist now are the result of a commitment implemented from the 1970s to improve water service for all in the US.

Currently, the TA model is dependent on several factors:

1. Continued funding from the federal government to support activities. The federal government has largely been responsible for funding the TA system to date, with

- some matching funding from state primacy agencies on an as-needed basis. Almost all states are currently in funding crises, even as new regulatory requirements are demanding greater diligence in working with rural communities.
2. Continued funding in grants and loans for small water systems. While the federal government provides funding for the major TA programs, this expenditure could be in part justified as it undoubtedly contributes to the extremely high loan-repayment rate by small water systems in the U.S.
 3. Continued interest in allowing communities to maintain autonomy over local water systems – since TA providers must ultimately have community partners to work with.
 4. A continued mix of ownership and operations systems in the US. The TA model works because the installation of water and sanitation and delivery of those services in the US is carried out through a combination of public actors (local and regional government), non-governmental oversight bodies (community water boards or districts), and private sector actors (engineering firms, equipment suppliers, and occasionally for-profit private sector providers).

For small communities and for the TA providers who work in those communities, there are several key challenges to continuing to improve access to water service in small communities:

1. Many of the infrastructure systems installed through the first three quarters of the 20th Century will wear out in the next twenty years. In a time when the Government is less committed to investment in infrastructure and social services, this constitutes a significant burden on small systems.¹⁷
2. As the health, safety, and environmental regulations have become more sophisticated, community water systems are faced with ever more stringent requirements for compliance with these standards. With state departments of environment and health facing shrinking resources, NGO TA providers are increasingly relied on to work with communities to bring them into compliance.
3. According to the 2000 US Census, rural residents of the US are currently on average less wealthy, have lower education attainment, have lower levels of skills, and live in worse housing stock than urban residents.
4. Many communities are facing pressures from urban sprawl. Others, in the Midwest, are facing problems of out-migration. These divergent trends may have the perverse effects in both places of causing water system pollution (through neglect or unplanned development) while driving up prices to fix the problem.
5. In areas where there are industries, these are often low-wage industries related to the agricultural sector, such as meat-packing plants or agricultural product processing facilities. These types of businesses tend to attract migrant laborers. Serving these populations is often difficult because of language and their tenuous relationship to the US government.

¹⁷ See EPA. 2002. Infrastructure Gap Analysis for Drinking Water and Clean Water Systems. <http://www.epa.gov/safewater/gap/>.

6. Replicability in Developing Countries

In terms of replicating this model in the context of developing countries, the US TA model has advantages and disadvantages. The advantages are that community TA systems:

1. Could build on existing animation and extension systems that might be in place in the developing countries.
2. Would allow for flexibility, since the TA system is implemented through NGOs.
3. Could be funded as a portion of grant and loan programs for small water systems.
4. Play a role in linking communities with funding and other resources that should be available.
5. Play a key role in linking communities and water system operators to government, NGO, and private sector entities critical to water system development. By doing this they build networks and ultimately build local capacity for water-system management.

The main limitations of the model in serving small towns are:

1. Funding for TA often is sector-based, and NGO TA providers have trouble finding resources to connect water and wastewater TA to broader community capacity and economic development issues – including integrating water utilities with other basic services to achieve economies of scope and scale.
2. Community politics may be the biggest hindrance to well working utilities – limiting what the TA provider can accomplish.
3. Some TA is purely technical and can be accomplished through short interactions – e.g. technology adjustments, leak detection. This gets the job done, but tends not to build local capacity, as communities generally do not end up with someone who is capable of fixing the problem the next time it occurs.
4. More lasting TA involves capacity building. This takes time, building local interest, support, and responsibility. Continual visits over several months or even years may be necessary – even after the initial crisis is past. This also takes money. It also will be a growing challenge to develop useful indicators of performance.

7. Ranking the TA model

Table C3.8: How does the model rate in its effectiveness in providing specialist services?

	Specialist Services	Rating from zero to five (five is the highest rating)	Reasons
Financial	Financial management training	4	Financial management experts are on staff at RCAP and the Environmental Finance Center Network and have conducted training at the community level on issues ranging from general accounting procedures to accounting responsibilities of operators and community water boards.
	Business planning	3	There is some attention to business planning, but in so many cases the work with the community water system is about making them viable right now, not about planning for future growth. In the context of a municipal utility, business planning must involve planning at the larger community level – which RCAP employees are working with communities to do.
	Tariff setting	4	RCAP works on a regular basis to help communities and water system operators to determine rates that will provide the utility with adequate resources for operations, maintenance, and a reserve.

Financial	Customer relations	4	Customer relations are generally considered a local utility issue. However, both RCAP and NRWA provide advice and training to small water system operators on best practices for customer relations, including handling complaints, communicating changes in service or rates and administration.
	Access to finance	4	A significant part of RCAP's work is to help small communities and water systems to have access to loans and grants. Additionally, EFCN is specifically given the mandate of helping address small community finance issues.
Technical	Technical training	4	Both RCAP and NRWA have grants from EPA specifically to provide technical training on safe drinking water and clean water (sanitation) rules and regulations, capacity development, and operations and maintenance. Additionally NESC carries out pilots and demonstrations of technology and management practices for water and sanitation in small systems. The other technology centers produce tools for technical training.
	Expansion planning	4	RCAP specifically works in small communities to assist with small system expansion planning.
	Problem solving	4	RCAP and NRWA specifically work with small communities on problem identification and problem solving. NRWA provides a circuit-rider service. RCAP works to solve administrative problems as well.
	Efficiency improvement	4	RCAP and NRWA specifically work with small water systems to improve efficiency of service. Currently RCAP is working on a program to make service more efficient through water system optimization. It works with operators to look more systematically at operations.

Other	Procurement services	3	RCA P assists communities with procurement services, but tries through training to build local capacity for procurement of materials. Through regionalization, RCAP is working to make the process more efficient in communities where this is viable.
	Regulation	4	EPA provides training to NRWA and RCAP specifically to help small water systems comply with rules regulations.
	Construction management	3	USDA RUS has identified construction management as an area where they would like to improve capacity. Currently RCAP provides some assistance in construction management.
	Community Management	4	RCAP works with the community leadership to help them organize and carry out oversight of water and wastewater systems. In cases where no board has existed, RCAP helps the community to establish a village, town, community, or neighborhood water board for oversight of the water/sanitation system. RCAP trains water/sanitation boards in their roles and responsibilities.
	Asset Management	3	RCAP and EFCN increasingly work with small water systems and communities to account for infrastructure, operations (chemicals), administrative, and other assets and to calculate and plan for their depreciation over time.

**Town Water Supply
and Sanitation Services
Volume 3**

**NGO Technical Assistance Providers in the USA:
Case Studies**

**Companion Paper C3
Annex**

**Stephen Gasteyer
August 2003**

The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and should not be attributed in any manner to the World Bank, to its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent.

Specialist Support Options Study

NGO Technical Assistance Providers in the USA

CASE STUDIES

Stephen Gasteyer, Rural Community Assistance Program
August 2003

Case Study 1: Leveraging Funding for Economic Development: Alexandria Bay, New York (Water and Wastewater)

The Thousand Islands region thrives on tourist dollars during the summer months. --Thousands of people flock to the area with their families to visit the many historic sites and to enjoy the outdoor amenities that range from fishing and hunting, to white water kayaking, boating and scuba diving. However, as the season draws to a close, the region shuts down for a long winter, leaving few employment opportunities for residents. Subsequently, many

choose public assistance to sustain themselves through the off-season, and live in impoverished conditions, oftentimes lacking running water or systems of waste removal. Such

conditions are not only detrimental to the quality of life and public health, but also pose a serious threat to the St. Lawrence River, the resource that they depend on for their vitality.

In this economy there is little capital available to upgrade tired infrastructure and to install facilities that have never existed. Three municipalities – the Towns of Alexandria, Clayton and Orleans – formed a five-year strategic plan outlining how they intended to improve economic opportunities in the region.

With the help of facilitators such as RCAP, project leaders worked together to pool their requests for funds and their plans for waste management. There have been almost decade-long efforts to develop sound engineering plans, prepare funding proposals, garner support from legislators with line-item capabilities, and demonstrate the grass-roots involvement in creating what they called the Route 12 corridor project. On March 14, 2003, these communities, local business leaders, politicians, and state/federal agency well-wishers met as the USDA awarded the project \$2.5 million dollars. Additional funding will be forthcoming from Community Development Block Grants (CDBG) funds, the New York State Governor's grants to small communities, and private



Northeast RCAP staff, from left to right, Bill Webb, Regional Manager, Scott Mueller, Waster Resources Specialist, New York, Karen Koller, Executive Director.
Photo by Carol Hess

resources. And this is just the first phase of a three-step process to bring economic vitality to the region.

RCAP has been instrumental in keeping the project moving when times were discouraging, in preparing applications and in bringing this project to the attention of organizations in a position to help. In addition to being featured by the New York State Association of Towns as a top case study in which federal and state agencies have worked together to provide co-funding, the Corridor project was highlighted at RCAP's 2001 national meeting in Washington, DC. Community leaders credit RCAP for bringing needed organization, expertise, and outreach, all of which were needed to get this project where it is today.

Case Study 2: Stonington, Maine—Watershed and Wastewater Infrastructure Planning and Development (Water and Wastewater)

Stonington is an island community of 1,200 people 70 miles southeast of Bangor, Maine. It shares the island with the neighboring town of Deer Isle, and is connected to the mainland by one bridge and one causeway. The economy is largely based on marine fishing and seasonal residents/tourism. The public water supply is comprised of several wells located in one watershed shared by approximately 50 residences and serves primarily the downtown waterfront area. The drinking water supply system suffers from limited quantity and failing infrastructure.

RCAP began working with Stonington approximately five years ago on a watershed protection ordinance. Since then, RCAP has met with the Stonington Watershed Protection Ordinance committee regularly during this period. Last month the completed ordinance passed easily at the town meeting, and central to the acceptance of this ordinance was a topographical map of the watershed delineating affected acreage produced by Northeast RCAP.

RCAP's technical assistance has grown over time, and TA providers are now involved in helping the community to develop a comprehensive plan for the town. This includes wellhead protection (gates, fences, etc.), as well as water and wastewater system extension, repair, and upgrade. The comprehensive plan will integrate the watershed protection ordinance, the shorelands protection ordinance, and community infrastructure with existing and planned housing and economic concerns.

As part of the comprehensive water protection efforts, RCAP is assisting the community to develop a wastewater extension project to remediate an immediate public health threat of approximately fifty failing, aged septic systems. The TA Provider assisted the community to carry out an income survey to demonstrate appropriate need as part of a Community Development Block Grant (CDBG) application. If funding is approved through this source, the community will be able to begin the process of requesting bids from engineering firms to implement the expansion. Currently the community and TA provider are awaiting a funding decision. This project demonstrates the role of the TA

provider in local organization and guidance on local governance, but in also serving as a liaison to outside agencies and funding sources.

Case Study 3: Gila Bend, Arizona: Technical Assistance and Infrastructure Planning (Water and Wastewater)

Gila Bend is a dusty community of about 1,747, located southwest of Phoenix. The population is about half Anglo, half Mexican/Hispanic. The town is served as a roadside stop-off when the Rte 8 was the main road toward Mexico—and before that as a stop on the Santa Fe railroad line. The town served as a depot and refueling point. The town is now relatively low income, with a medium household income of \$17,820 and a low income population of \$1,247, 71% of the total population, according to the 2000 Census,

The RCAP TA provider was initially referred to the community by the Arizona (AZ) Department of Environmental Quality (DEQ) and the AZ office of Rural Development (RD). They wanted him to help the community address excessive fluoride contamination of the water supply. The TA provider helped the community to identify as a solution, plan, and raise funding (through a 75% grant and 25% loan) for the installation of a reverse osmosis (RO) facility to address the issue. The plant has now been installed and it is treating water for the community.

The TA provider has also served the community in several other critical ways. First, he has provided technical guidance on planning expansion of the water and wastewater system. This has included discussions with town officials about the linkage between infrastructure development and community economic development. Water and sewer lines have been extended toward a new mobile home park, restaurant, and hotel south and west of town. They have also been extended toward a new coal-powered energy plant that will serve California—and will be located northeast of town. Residential in-fill is already taking place in that direction. The TA provider helped community to find funds that will let them extend their system to include adjunct 14 acres.

He also served as an advisor to orient an interim and later replacement for the community's utility manager, who passed away unexpectedly several years ago. Among other services, he has helped the new utility manager and an assistant with training for upgrading operator status. The TA provider additionally advises the water/wastewater utility manager on management of the wastewater facility—including optimal sludge levels, solids circulation, and disposal of 'residual'.

Through this integrated TA process, RCAP is assisting Gila Bend to improve water and sanitation and community expansion and economic development.

Case Study 4: Liberty Center, Iowa Stops Illegal Wastewater Discharge

RCAP recently completed almost two years of assistance in the Warren County, Iowa community of Liberty Center, a small-unincorporated town just south of Des Moines, the capitol of the state of Iowa. RCAP was asked to work with the community because illegal

discharge of wastewater into a ditch and small stream resulted in a Notice of Violation issued by the Iowa Department of Natural Resources (IDNR), the state primacy agency.

The RCAP TA provider initially worked with the community to determine the scope of the problem and discuss options for addressing it. She then assisted the community in the coordination and analysis of two surveys: an income and interest survey. The results demonstrated that Liberty Center was sufficiently low-income community and had sufficiently strong interest in addressing their wastewater problem that the community was eligible for subsidized loan and grant funding from the government.

The TA provider worked to facilitate a process between the community representatives, the project engineer, and the USDA RD engineer to decide whether to use an onsite alternative technology or a force main leading to a nearby underutilized school lagoon. Discussions between the project engineer and USDA state engineer continued throughout the winter of 2002. In March, when all parties agreed to a regional approach utilizing the school lagoon, the Iowa Department of Economic Development awarded a \$72,000 grant to Liberty Center. The grant was followed by a proposal to USDA for a \$309,000 grant and \$132,000 loan.

The county intended to purchase the school lagoon, however a purchase price had to be negotiated between the county and the school district. The grant/loan funds included only \$10,000 for purchase of the lagoon, so any higher price would result in higher monthly payments by residents. With the TA provider negotiating these factors, the county eventually agreed to pay \$40,000 to the school district for the lagoon.

Evaluation of the cost of the lagoon is still subject to an assessor's appraisal to meet state requirements. The TA provider has worked facilitating discussions among the community, county, and Warren Water. Discussions continue about how maintenance of the system will be carried out. Warren Water has been represented at all meetings and could assume management and maintenance of the system. RCAP staff recently provided the county with sample maintenance agreements to use as a basis for negotiations with Warren Water.

Because this regional approach to the town's wastewater problem appears to be highly successful, the steering committee plans to meet in the near future to use this approach to resolve similar problems around the county. The role of the TA provider in this case has been not only to provide TA about technical and financial options, but to facilitate decision making and actions based on those decisions.

Case Study 5: Santa Domingo, Pueblo (Water, Wastewater, Solid Waste)

In 1999 the Santo Domingo Pueblo of New Mexico recognized an urgent need to replace the majority of their drinking water and wastewater systems. The Tribe decided to appoint a five-member Utility Commission to address the problems. In late 1999 RCAP field staff in Santa Fe, New Mexico were asked to help the newly formed Utility Commission to develop policies, procedures, operating guidelines, budgets, utility rates

and staff, and raise funds for solid waste operations, water and wastewater improvements. During the past four years RCAP has helped the tribe with utility commission training, as well as raising funds for staff and developing a solid waste program. We also have helped to raise \$4.9 million from a combination of FY 2001-2002 funds from federal and state entities to rebuild the drinking water and wastewater systems

The Santo Domingo Tribe is a federally recognized Indian nation of 4,611 people, with all of the community low income and over 39 percent of the households living in poverty. One of 19 pueblo tribes in New Mexico, Santo Domingo Tribe is considered the “center” of Pueblo culture in the state.

The state of New Mexico, through the New Mexico Finance Authority (NMFA), has given the tribe \$3.735 million for improvements to drinking water and wastewater systems, the largest grant to a tribe in the state’s history. RCAP has continued to provide technical assistance to the tribe to ensure that details of funding by NMFA, USDA (\$560,000), and Indian Health Service (\$600,000), as well as engineering, design, specifications, and contracting needs are completed according to funding agencies requirements. Technical assistance is now focused on helping to keep the Utility Commissioners, the new Tribal Administration, and the community, aware of the project's progress, and helping the tribe to respond to funders in a timely manner, regarding final engineering reports and other documents necessary for receipt of funds. RCAP also has been involved in helping the tribe to secure engineering services, and will be involved in the proposal and selection process for construction.

RCAP’s work with the Santo Domingo Tribe originated with solid waste issues. Before the Utility Department was created, RCAP wrote the tribe’s first USDA solid waste grant, funded in FY 2001 for \$106,000. This grant has funded solid waste program staff, outreach and education efforts. The solid waste program manager and the utility director were both hired in Spring, 2002 and since then have transformed the tribe’s utility department and operations. They report that utility fee collections are on the rise and service to tribal members has improved substantially.

In another arena, the Santo Domingo Tribe wanted to build a new health facility for its growing population since 1988. The Tribe turned to RCAP in May of 2001 with a separate fee-for-services contract, to help plan a new health facility. Within two months RCAP met with a new health facility planning committee to conduct a needs assessment, negotiated with Indian Health Service for service and lease agreements, prepared concept design drawings and cost estimates and prepared funding applications. This case demonstrates the role of TA providers in serving the community in multiple sectors over time. The TA plays a key role in helping the community to see the linkage among related environmental services, and in helping the community to make the case for to funding agencies for both infrastructure construction and management organization.

Case Study 6: Hopeville, Arizona: Community Development Support and Advocacy (Water)

Hopeville is an African American community of approximately 250 settled in 1981 after years of struggle by the community to receive a land grant outside of the flood plain, where the community was originally settled after being brought to Arizona from Texas to work the Cotton fields. The community is 92% low income.

The RCAP TA provider has assisted the community in a number of areas. First, he helped the community to upgrade its physical and administrative infrastructure of their water system. Hopeville has a well and water tower that serves the community. The well is getting low and beginning to pump sand and other sediment. As such it may need to be redrilled/deepened or a new well may need to be drilled. The tower may also need some improvements, as while it is in pretty good shape, it is beginning to have some problems with rust. Additionally, there is currently no office for the water system (all files and records are kept in Reverend Harris' office in the church). For the community, these issues are related to the desire to upgrade the community infrastructure in general, including water, sanitation, and housing stock.

The TA provider has helped the community with advice regarding the water system, and facilitates work on housing improvements. He has worked with the community on operations and maintenance of the community water source and sewage system. This has included working with the community leaders to make them aware of regulations and requirements for water systems management, and has served as a liaison between the community and health and sanitation regulators. He has both assisted the community in developing plans to upgrade the administrative facilities of the water utility, and has helped the community bring water system up to date—including procurement of replacements for out-dated material such as valves, meters, pumps. He helped the community raise money, contract for and implement painting and extending the water distribution line.

He also serves in advising the community on management decisions. This has been particularly important in recent years in helping the community to withstand pressure from the Sundance Development company, who wanted the community water system to supply development plans in greater the Phoenix areas. Sundance first approached the community about buying the water system (and source) and servicing the community with that water. The offer was extremely aggressive, and the TA provider assisted the community by counseling them that they did not have to sell their water system. Sundance then attempted to have the water system condemned for compliance problems. The TA provider used connections with the AZ DEQ to assure that the system would not be condemned. The water source has provided leveraging capital for community development, as the interest from Sundance Development demonstrated the potential for expansion given the water source in the area. The TA provider has worked with the community to write funding applications for a range of infrastructure and environmental services improvements that will improve quality of life for this poor community.

This case study demonstrates the role of the TA provider in helping the community not only in securing financial resources and technical advice, but also in serving as a liaison to government and other institutions. This liaison provides political leverage that can neutralize local powerful actors who may seek to undermine community development initiatives.

Case Study 7: Iberville Parish, Water District #4, Louisiana (Water)

This is a small, rural water system that serves the unincorporated areas in the north part of Iberville Parish. This system also sells water to the Village of Grosse Tete. The system has 2 wells. One is almost 20 years old and the other one is new. The new well came on line in February 2003. The community also has 3 elevated storage tanks. This system has a sampling plan that is about 10 years old. The old plan does not include the portion of the system that connects the new well to the original portion of the Water District. Therefore, the sampling plan must be updated and submitted to DHH for approval before the system can begin working on the D/DBP Monitoring Plan that is due on July 1, 2003. This system uses chlorine to disinfect their water. The system contacted RCAP to obtain assistance with the preparation of a new sampling plan, help with the preparation and submission of required reports, and for operator training on Safe Drinking Water Act regulatory requirements. The TA provider is now in the process of advising the community on development of a new water sampling plan and helping the water system staff to prepare the reports. A critical role of the TA provider has been to brief system personnel on the changes in the SDWA health and safety regulations, specifically the “Decontaminant and Disinfection By-Product (D/DBP) rule, which will require water monitoring for chemical residues. This case study demonstrates the role of TA providers in helping small community water systems to stay in compliance with health and safety regulations. The case also demonstrates how, even when the TA provider is not sent to the community by the regulatory agency, knowledge of coming regulations can lead to community requests for TA assistance in complying with those regulations.

Case Study 8: Rural Water District #5, Mayes County, Oklahoma

This Rural Water District recently reorganized from a non-profit organization under Title 18 to a Rural Water District under Title 82, making it a publicly owned water utility. The system contacted the southern RCAP TA provider to assist as they apply to Oklahoma Water Resources Board for a loan to improve and upgrade their water system. The TA provider has assisted them in developing an updated set of bylaws, in developing a revised set of rules and regulations, and in implementing other minor changes to their organizational structure necessary to secure financing. The water district purchases treated water and is strung out about 30 miles from one end of their system to the other. They have 6 storage tanks and one chlorination station. The major part of the system is located in Mayes County but they also serve parts of Rogers, Nowata and Craig Counties. The financing would allow the water system to upgrade connections and treatment options for the community. This case study demonstrates the role of the TA provider in

both advising water systems on management options and infrastructure upgrades, and in matching administrative changes to financing requirements.

Case Study 9: Ellendale, Delaware (Combined water and wastewater planning)

Ellendale, Delaware is a small hamlet on Routes 113 and 16 on a major route to Delaware beaches about halfway between Milford and Georgetown. Agriculture is the primary land use in the greater Ellendale area, while the Ellendale State Forest marks the area's northern, southern, and western boundaries. The region lies on the drainage divide for seven creeks, and is within Delaware's coastal plain. This land tends to be flatter and wetter than surrounding landscapes. Land in the Ellendale area also has poor soils and high seasonal groundwater levels.

Since Ellendale is an impoverished community with poor drinking water, the town had to make a tough decision; there was only enough money to create either a central sewer district or central water supply. The TA provider worked with First State Community Action Agency, Citizens of Ellendale, County, State and Federal officials who determined that a central sewer district would be more important since it would eliminate the continued ground pollution thereby improving the quality of ground water. The sewer project is soon to be completed and the cost per household is \$400.00 per year. Still, the residents continue to use their private wells of poor water quality.

There are 100 housing units in the town with an approximate population of 350. Two areas outside the incorporated area that would hook into a new water system should one be constructed are New Hope Road and New Market Village. The actual number of connections that would be required to serve these areas is unknown at this time. A large concern of all agencies involved in this project is the cost burden of a new water system (in addition to the sewer cost) per year to this low to moderate income community. First State Community Action Agency has advised that they would be interested in sharing the ownership and cost of the water system with a local private firm, Tidewater Utilities. However, the ownership of this nature would make the cost of water much higher than if the Tidewater Utilities owned the system alone.

Another issue of concern is that some of the homes are beyond repair and cannot accept water hookups due to their age and other problems. Milford Affordable Housing, Inc., has shown an interest in purchasing land outside the incorporated area of Ellendale to build affordable housing for the residents of homes that are beyond repair. This would not only provide new housing to community resident but as well provide water service. Tidewater Utilities advised that they could put in place a portable water system with hook ups to serve up to 49 homes for this housing project. Above the 49th home a larger system would have to be installed due to fireflow and pressure requirements.

The TA provider, USDA/RUS, Sussex County Housing Authority, Community Development Block Grant (CDBG) staff, First State Community Action Agency, the Office of Drinking Water, Tidewater Utilities, Milford Affordable Housing, Inc., members of the clergy in the Ellendale area and other entities have been and will

continue attending meetings to put forth ideas to hopefully make this water project possible. The Ellendale water project is in the early stages of assessing the community needs and the interest of the above mentioned agencies.

This case study demonstrates the role of the TA provider in participating in a multi-stakeholder process to upgrade community water and wastewater facilities to meet community and other needs.

Case Study 10: Greenwood, FL (Water System Planning)

Greenwood is a beautiful little town located in Jackson County, Florida. Greenwood initiated planning a drinking water improvement project before the improvements became a dire issue, so that the optimal plan for Greenwood could be determined. During the planning process, the Florida Department of Environmental Protection (DEP) asked Greenwood to consider offering water service to the town of Bascom. Bascom is a small community of approximately 100 residents just northeast of Greenville. Like many of the communities in this area, Bascom has a problem with EDB¹ contamination of their wells. The Florida DEP has placed filtration systems on their wells, but this is a costly alternative for the state.

In a joint effort, the Southeast RCAP and Florida RWA TA providers have combined to determine the feasibility of this project. The Florida Southeast RCAP office has conducted an informative community meeting regarding EDB contamination and the benefits on being on a community system. Southeast RCAP will also be providing income/interest survey materials and will conduct a door-to-door survey of Bascom and the surrounding region. Florida RWA has assisted the in calculating the engineering feasibility and design aspects of the potential project.

This case study demonstrates the role of TA providers in assisting in community water system planning. The case also demonstrates how different TA entities can collaborate in advising the community on different aspects of a given water initiative.

Case Study 11: Woodland Village, MD (Water System upgrades)

The community of Woodland Village consists of 104 households in a 100% African-American subdivision on the outskirts of the Town of Indian Head. The majority of the homes are owner-occupied, but there seems to be a growing trend for these properties to move toward rental occupancy. The area was a military base constructed in the late 40's to early 50's with infrastructure of the same vintage, now needing replacement. While the rest of Indian Head has benefited over time from improvements in infrastructure, the

¹ Ethylene dibromide (EDB) is a colorless, heavy organic liquid mainly used in anti-knock gasoline mixtures, particularly in aviation fuel, and as a solvent for resins, gums, and waxes; in waterproofing preparations; in making dyes and drugs; and as a pesticide for grains and fruit. EPA has found EDB to potentially cause the following health effects for relatively short periods such as damage to the liver, stomach, and adrenal glands, along with significant reproductive system toxicity, particularly the testes. Lifetime exposure may include damage to the respiratory system, nervous system, liver, heart, and kidneys; cancer. http://www.epa.gov/safewater/contaminants/dw_contamfs/ethylene.html.

Woodland Village community has felt passed over and left out. According to community spokesman, Frances Simmons, they have been attempting to have their community needs become a priority of the Town for over twenty years.

The MD RCAP TA Provider has been working with the new Town Manager to conduct the income survey of the households in order to qualify the community for the maximum amount of funding for USDA, Maryland Department of Environment and CDBG funds. Preliminary review of the survey data in conjunction with a windshield survey of the community indicated that the community would qualify for maximum assistance from all agencies. Thanks in part to this information, a Senator Barbara Mikulski announced a grant of \$1,800,000 to serve the community. However, to access those resources, the community will be required to find a match for a portion of the amount.

The Woodland Village water system is served by Well #5 which is part of the Indian Head water system. Total Indian Head water storage capacity is 300,000 gallons and can serve a population of approximately 3500. The TA provider has continued to help the community work with engineers on developing final engineering reports, which will address distribution, source water and capacity to serve Woodland Village. She will also assist the community in development of an application for CDBG and other funding options, based in part on results of the income and interest surveys.

The completion of this project will help raise community pride, stabilize the community, increase property values, lead to more community cohesion and enable property owners to undertake other improvements to their properties. The MD RCAP TAP will continue to facilitate funding applications and income surveys, agency meetings and more to assist this low-income community.

Case Study 12: Dearborn, MO Experiences Growth Needs (Water system upgrade)

The town of Dearborn a quiet little community located in Northwest, Missouri. The community currently has 204 homes and a population of 529. While Northwest, Missouri is an agricultural area, Dearborn is facing the possibility of becoming larger, due to its location between two major cities, Kansas City and St. Joseph. Urban sprawl could have a huge impact on this community in the future. The majority of residents have been born and raised in the area and many commute to Kansas City for employment. The community is situated only two miles off of a major highway, which could lure businesses or other economic opportunities to this small town. The residents are concerned about the cost of fees for services and changes to their overall quality of life.

Dearborn is in Platte County and currently receives its water from the local reservoir. The water system is aging and outdated and quality of water is poor. Dearborn will not be able to meet the upcoming regulations for surface water systems. The community wants to be proactive and have a water system that will provide water service at a reasonable cost. They have agreements for connection to the Kansas City water system, but lack the funding to pay for the connection.

In June 2002, the Missouri Department of Natural Resources (DNR) contacted the Midwest RCAP to assist the community with determining if there are feasible funding options for water system improvements. Midwest RCAP is assisting the mayor and council with addressing feasibility issues, initial application procedures, and negotiations with Kansas City officials regarding the connection contract. If it is feasible to connect to the Kansas City system, Midwest RCAP will work with the community and funding agencies to help bring the project to completion.

This case demonstrates the role of TA provider in helping the community in planning and negotiations with larger entities: in this case the DNR and the city of Kansas City.

Case Study 13: Castleton, Massachusetts (Water system improvement)

Castleton has one existing water system which serves the central village area including Castleton State College. Because this district only serves a portion of the total town, the Fire District is named Castleton Fire District # 1. A nearby region of the town has serious water quality and quantity issues. These residents decided to form another district, Castleton Fire District # 3. There is a District # 2 which is not a water system and is not adjacent.

District #3 has successfully built a water system to serve its community and has connected to District # 1, utilizing the very high quality source of water which District # 1 enjoys. District # 1's water supply in fact has the permitted capacity to serve many more residents. In another part of the town, near Lake Bomoseen, also nearby, Northeast RCAP is assisting residents to form what will probably be Castleton Fire District # 4. These residents, like those of district # 3 have quality and quantity issues and are very interested in having good water. Creating these new systems will rectify many water quality and quantity problems in both households and businesses.

Northeast RCAP is providing assistance to the future District #4 so that they educate their residents to support the formation of the new district (Castleton Fire District # 4) and build a new system, as District # 3 has done. In District # 3, billing and hookup issues continue to require attention. Northeast RCAP is providing guidance for creating a rate structure that will be acceptable to the residents and hopefully based upon their new meters. Northeast RCAP is also assisting the greater Town with planning and storm water discharge issues. This is very important to more fully protect the very valuable source wells used for all these systems. Fortunately the community recognizes the value of their high quality and quantity source.

Northeast RCAP is working on the possible creation of an inter-municipal agreement (actually called an inter-local agreement in this case) between Fire District # 1 and Fire District # 3. It will be important over time to maintain a good relationship among the Fire Districts and the Town. Northeast RCAP staff is attempting to create a capacity allocation ordinance with that in mind.

The Castleton projects are truly taking on a regional identity. The community is very much interested in protecting its water resources while making them available to residents at an affordable cost. Because this diverse community serves year-round residents, businesses, commercial, agricultural, and lakeside residents and is located where ground water resources are not plentiful, Northeast RCAP anticipates work in this area beyond the creation of the District #4 and the water system.

This case study demonstrates the role of the TA provider in helping facilitate planning and intracommunity agreements to expand water service.

Case Study 14: Farmington, Maine (water).

The Farmington Hill Apartment Line Connection project involves three apartment complexes with individual wells, all of which have water quantity and water quality problems. Ninety-four percent of the residents qualify as very low to low income. The Farmington Water District is willing to extend their line to hook up the apartments on a master meter. The three apartments also need to be interconnected to receive the water. RCAP assisted this community by:

- Conducting needs assessment
- Determining eligibility for loan(s)
- Preparing application for loan(s)
- Providing help with procurement of engineering / professional services (RFQ, RFP)
- Facilitating communication between community/system and primacy agency or other entities and utilities
- Conducting community informational meetings
- Preparing public information notices

RCAP has organized discussion and cooperation between the apartments, Village (water) Corporation, the town, and Maine Rural Water. RCAP assisted the groups by writing the CDBG planning grant application, and presenting it to the selectmen. The grant was submitted on March 7, and funding of \$10,000 was awarded April 9, 2003. RCAP will continue assistance with the RFQ process to select an engineering firm. Also, RCAP will ensure cooperation between entities so that the report can be used for infrastructure grant applications this coming September.

This case study demonstrates the role of the TA provider in not only helping communities to develop a solution to a recognized problem, in this case through linking an apartment to existing water systems. The TA provider also plays a key role in helping the community to find funding to accomplish the project once the solution was identified and agreed to.

Case Study 15: Food Tree Project, WI (water)

The Food Tree Project area is located in Wood County's Town of Rudolph. Food Tree is a convenience store at the edge of a residential area with 50 homes. The homes are on

septic systems and each has its own drinking water well. Over half of the residents are estimated to be low-moderate income with the median household income at less than \$20,000/year.

Food Tree was a groundwater remediation site during the mid- 1990's; the WDNR closed the remediation project when the site appeared to be cleaned up. In 2001, however, residential wells became contaminated with benzene and MTBE, a component of unleaded gasoline. In January 2003, WDNR reported that bulk water being delivered to 3 homes (wells are capped off), and 4 are receiving bottled water for drinking. The plume appears to be moving towards additional homes. The residents have filed a lawsuit against the Food Tree Owner. WDNR has requested RCAP assistance to locate a solution to providing bulk water.

Through WDNR contacts, RCAP had been tracking the progress of the well contamination (gasoline) for two years. There are approximately 20 homes in the immediate threat area, and there is a pending lawsuit between some homeowners (plaintiff) and Food Tree (defendant). RCAP was asked by the plaintiff's attorney and defendant's attorney to assist in looking for a permanent solution to the problem. During the second quarter RCAP talked with the plaintiff's and defendant's attorneys, and their engineering firms to determine the basis of the lawsuit, and discuss potential alternatives. RCAP also spoke with WDNR's water supply engineer to discuss the three main alternatives: connection to the nearby City of Wisconsin Rapids, drilling off-site wells for the entire 50-home area, or drilling off-site wells for the potentially-impacted homes. All solutions will be very costly.

An On-Site meeting was conducted by RCAP on 1/15/03 to meet with the Town of Rudolph's Chairperson and one Supervisor to discuss the history of the Food Tree area, and income levels. Based on requests with the Town Chair, Supervisor, and two Attorneys, RCAP conducted an income survey of the 16 residences in the pathway of the gasoline plume (Greenfield Avenue). RCAP determined the MHI to be \$29,500. RCAP sent the results to the law firms, with a letter explaining that the income survey only reflects incomes on Greenfield Avenue. Any solution covering a broader area would need to survey more residences.

The Judge is expected to make a ruling on the lawsuit in June--one of the attorneys anticipates that it will require that the defendant pay for engineering services to consider the alternatives. RCAP will be re-contacted after the judgment is made. This shows the role of the TA provider in providing key assessments to resolve community conflict regarding the water supply.

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Volume 3**

**A Comparative Study of Market
Consolidation and Aggregation in Town
WSS Service Provision in Colombia**

Companion Paper C4

**Mariela Garcia
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Specialist Support Options Study

A Comparative Study of Market Consolidation and Aggregation in Town WSS Service Provision in Colombia

Mariela García V.
with Luis Alfredo Loaiza and Alfredo Vanín¹
CINARA, Universidad del Valle
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Introduction

In this report two models are presented for service provision to towns of between 5,000 and 70,000 inhabitants, which in Colombia correspond to small and medium-sized towns². One is from the Department of Antioquia, where 8 newly formed local private operators are contracted to serve 36 small towns (a process of “market consolidation”). The second is the Valle del Cauca Water and Sewerage Company S.A., Acuavalle, a Government Owned Enterprise, which provides services for 33 small towns in the Valle Department (an “aggregated” approach to service provision). The report is based on case studies and extensive interviews with stakeholders in the towns of Marinilla and Caramanta in Antioquia, and Jamundi in Acuavalle (available in a companion report).

These two models provide valuable insights into the process of establishing commercially viable companies: the upward growth of local private companies in Antioquia, and the downsizing and restructuring of the Government Owned Company in Acuavalle. The need for good communications and ongoing relations with employees, Municipal administrators and end-users is highlighted as one of the main success factors.

A Background to the legal and regulatory framework is provided in Annex A, at the end of the report. Some key points are that:

- In 1954, a legislative act created the notion of “decentralized institutes” and led to the creation of municipal and departmental service providers, such as the Valle del Cauca Water and Sewerage Company S.A. in Acuavalle, and the Antioquia Water and Sewerage Company S.A. (called Acuantioquia).
- The Colombian political constitution promulgated in 1991 established that service can be provided by the state, the private sector, or organized communities. It also created a technical organization, the **Public Service Superintendence** to control, inspect and supervise the companies providing these services.
- Law 142 of 1994 created the **Drinking Water and Basic Sanitation Regulation Commission (CRA)**, which has responsibility for regulating natural monopolies, and economic competition, tariffs, service quality, and efficient management. It defined the user’s role in supervision of the ESPs (Public Service Enterprises) and

¹ A complete list of acknowledgements is included at the end of the paper.

² Ministerio de Desarrollo Económico- Dirección General de Agua Potable y Saneamiento Básico (2002). Sector de Agua Potable y Saneamiento Básico : Retos y Resultados. Bogotá: Stilo Impresores Ltda.

- created the option of forming **Development and Social Control Committees** in each municipality.
- The CRA established a tariff methodology which public service providing entities should apply. According to this, the tariffs should cover: *average administration expenditure, average operational and maintenance expenditure, and average investment expenditure.*
 - Homes are classified into a maximum of 6 strata: I low - low, II medium – low, III low, IV medium, V medium-high, VI high. Low income strata are subsidized.

Table 1 summarizes the main institutions related to the sector and their responsibilities.

National Level	
Entity	Function
National Planning Department	Formulates the National Development Plan
Environment, Housing and Territorial Development Ministry	Defines policies, provides technical assistance and promotes technological development.
Drinking Water and Basic Sanitation General Direction	In addition, they determine water resource use, repayment and compensatory taxes, and wastewater standards.
Drinking Water and Basic Sanitation Regulation Commission	Establishes the regulation framework, competition, and the tariff and subsidy system.
Public Service Superintendence	Supervises and controls the sector aiming to ensure that companies observe efficiency indicators and that tariffs reflect the real costs of service, and promotes service quality control, including citizen committees.
Health Ministry	Supervises water quality.
Findeter	Offers financial support to the sector.
National Guarantee Fund	Provides guarantees for small and medium-sized business loans.
Departmental Level	
Departments	Provide technical assistance, training and support for regional organizations.
Municipal Level	
Municipalities	Obtain financing for works, grant subsidies to strata I, II, and III.

1.0 Small and medium sized companies (“PYMES”) in Antioquia

“I wound up flying in the government helicopter with representatives from Spanish and French companies to show them the municipalities that Acuantioquia managed...When we flew over Medellín, they always told me, the one we’re interested in is this one. The small towns didn’t interest anyone. So no foreign company participated in the tendering because they didn’t think it was good business” [General Manager ASS S.A.]

The model of small and medium-sized private companies (called PYMES), was developed in the Department of Antioquia. In 1996, the Governor of Antioquia took the decision to liquidate Acuantioquia, but there appeared to be few alternative options. The solution that was proposed was to promote participation of local private companies in a competitive tendering process.

Eight companies were selected to manage and operate 36 systems in an equal number of municipalities (See Annex B). The tenders were opened in 1996, and of the eight companies that won, seven were from Antioquia, and one from Bogotá. According to the Planning Chief of Ingenieria Total Servicios Públicos S.A. – E.S.P., “*the only public service enterprise that existed in Antioquia was Medellín Public Enterprises*”, which was not interested in these small towns, meaning that those who took part in the tendering were companies that had been recently set up. One was made up of engineers that had been employed by Acuantioquia, three were Acuantioquia contractors and the others the fruit of alliances between building engineers, and specialized consultancy firms³.

The operators received run-down systems, with infrastructure that was over 30 years old, and lists of users that were more than 10 years out of date. The municipal administrations lacked any clear investment plans, and had few resources to make any kind of improvements. And the companies did not take off too well, remembers Jorge Alberto Osorio, the first manager of Ingenieria Total Servicios Públicos S.A. – E.S.P.: “*...there was a very serious problem with the unions. If they didn’t pay off all of the staff, and hand over the systems, Acuantioquia would not disappear so easily. So, I remember very well that on October 29th, they phoned us from the government and told us: on November 2nd, that is, three days later, those systems have got to be working or there’s no contract. On Friday, Saturday, and Sunday, I had to receive the systems, and go with a lawyer to tell Acuantioquia’s workers: we’re going to give you three month contracts, you’re going to get paid off or sacked, here you’ve got a three month contract. Three months while we organize ourselves and see what staff we’ll be keeping. In those three months we got down to the job of setting up the business. At the end of that period I made the first staff cuts, because in general, in all of the municipalities, there were too many people. For example, in the Andes municipality, which is the biggest one, there were 19 operational staff, and according to our analysis, we only needed 12. We kept 12 and we gave them six month contracts, and then we got down to the job of starting to get to know the staff...*”.

In overcoming these initial difficulties, all of the companies have applied a similar philosophy, that they are providing a public service, and therefore, they have, as the manager of Sistemas Públicos S.A. E.S.P. says, “*a concern for the service given to the user*”. These companies are directed by values such as honesty, transparency, respect, responsibility and commitment.

In Colombia as a whole there has not been widespread involvement of private companies in water supply and sanitation. One of the reasons that this option has taken off in Antioquia is the fact that the region, more than any other in Colombia, has been able to promote a culture of effective management. Referring to the Antioquia Mines School^{4, 5}:

³ In Conhydra’s case, to participate in the tendering, a consultancy business with headquarters in Pereira called Hydra S.A joined up with a building business called Sagas, so that at the beginning, what is now called Conhydra was named Consorcio Hydra-Sagas. Total Engineering E.S.P. took part in the tendering as Total Engineering Ltd, a building enterprise that had 15 years of experience in building of aqueducts and sewerage.

⁴ Founded in 1880, this school is considered the first educational center in the country that was directed towards training the professionals that promoted the industrial launch of the country.

“The engineering education offered by the Mines School combined rigorous technical training with a distinctive work philosophy, managerial exercise, and capital accumulation, factors which meant that the region of Antioquia was head and shoulders above the rest in competition, and still continues.”

On the other hand, there is a very well regarded company dedicated to public services, Medellín Public Enterprises E.S.P., which is a good benchmark and motivation for the businessmen linked to the PYMES. These contextual factors combined with the flexibility that the businessmen have shown to adapt themselves to the conditions they have encountered, such as trying to support and get support from the mayors for financial resources, which allow for improvements to be made to the infrastructure. These conditions have meant that “the experiment”, as some people call it, has been able to function for six years, with very successful results in localities like Marinilla. Although some localities have been more successful than others, all of the companies are holding ground. Until now, none of the systems have been given back by the operators.

The emergence of the PYMES has been against a background of conflict regarding the liquidation of Acuantioquia. Although six years have passed since the beginning of this process, the situation still has repercussions for the companies⁶. As Acuantioquia is undergoing a liquidation process, it cannot invest, but as many of the municipalities are not owners of the systems, they do not want to invest. Therefore, in many cases, the operator has only managed to “*maintain the system*”.

However, there are signs of business development. For example, a number of companies have expanded their business through strategic alliances. And some of them have expanded business into other departments of Colombia. For example "Consortio Francisco Velasquez" now operates two towns in Choco, and “Conhydra” have merged with other companies to create a new company, "Hydropacífico", which serves Buenaventura, in the Valle del Cauca, with a population 271,000.

Conhydra is even working on the development of managerial tools for small systems, with the aim of developing a practical managerial model that can be made more widely available. This company has links with the Expopyme program promoted by the Ministry of Exterior Commerce, with the support of the Colombian Association for Small Industry, Guilds and Universities, aiming to open up opportunities to participate in tenders in South and Central American countries for service provision in small towns.

1.1 Challenges

The main challenges that the local private operators (PYMES) have had to face are:

⁵ James Parsons, Professor of the University of California, Berkeley. Prologue from the book by Mayor, Alberto (1989) *Ética, Trabajo y Productividad en Antioquia* (Ethics, Work and Productivity in Antioquia). Bogotá: Tercer Mundo Editores.

⁶ The slow liquidation of Acuantioquia has affected the PYMES. They are currently facing a block on their bank accounts caused by a claim made by the former Acuantioquia workers.

- Establishing themselves as private companies providing a public service where there has been no previous tradition of private sector participation.
- Skepticism from local communities and authorities to the concept of contracting a private operator which was not well promoted in the municipalities, and which was initially not well received.
- Achieving self-sustainability of systems that had been running at a loss. Acuantioquia had been charging highly subsidized tariffs, which were expected to support full cost recovery within five years. In some cases, this implied increases of up to 400%, creating great dissatisfaction amongst the users.
- The aggressive propaganda that political candidates used during the election period against private companies, because of the increase in the tariffs.
- Finding solutions to using or rehabilitating rundown infrastructure.
- Demonstrating that they are as efficient as big companies and multinationals, or more so, for managing and operating small and medium-sized systems.
- Professional training of staff in the new companies, as there is no national business organization in the public service field. The new companies have had to put interdisciplinary teams together who were prepared to learn on the job and take personal responsibility to create a good work ethic.
- Getting the financing institutions to understand their needs, since their greatest asset is knowledge and commitment, but they lack of infrastructure that can be used as a guarantee for loans.

1.2 Key stakeholders

- **Users.** Relations are constantly getting better in the majority of the municipalities. There are still some difficulties in some municipalities, e.g. in Segovia where the town is divided into four sectors, and each sector only has water every four days due to technical problems.
- **Municipalities.** Some mayors treat the companies as their great allies in system and service quality improvement and have been able to forge strong relations with them. Others have yet to experience real improvements, and remain skeptical.
- **Departmental government.** The departmental government does not have much influence in the work of the PYMES, but communicate when they co-finance works.
- **National government.** The companies are in contact with the Public Services Regulatory Commission, with the Drinking Water and Basic Sanitation General Direction, and the Public Service Superintendence, to whom they are accountable, and are in contact with the national government when work is co-financed from the national level.
- **Specialist services support.** Specific training is contracted for the companies' staff, water quality analysis, specific software preparation, legal advice, auditing, meter reading⁷ in some companies, and billing in others.

⁷ In Marinilla, the company has trained a Cooperative of Head of Family Women in reading meters, and this activity is contracted out to them. 6 women carry the work out, and cover the whole town in 3 days.

The majority of the companies recognize that the most important relationships in the PYMES model are with local governments and communities. The Manager of Conhydra says: *“it is extremely clear that the greatest allies are the mayors, the representatives, the Community Action Board, the user. At the moment, as we don’t have transparency with them, we can’t do anything. When the local communities give support, even the biggest problems can be dealt with. That’s the case of Turbo where the system needed to pump 150l/sec. and last summer with great difficulty they could only get up to 70l/sec. However, the community understood the problem and accepted the water that the company supplied by lorry tanks”*.

1.3 Institutional issues

The Antioquia government is the owner of 74% of Acuantioquia’s shares. Although the latter has been undergoing liquidation for the past 6 years, it remains the owner of 28 out of the 41 systems which were in its charge. Negotiations are underway with the municipalities so that they become owners of their own systems and can begin to invest in them.

The PYMES operate with a unique type of contract with Acuantioquia, lasting 15 years⁸, which can be extended for an equal period, and which does not obligate them to make investments with their own resources. The operator receives remuneration for the work it carries out, which can vary between 10 and 15% of revenues. In the cases in which the municipalities have bought the systems, Acuantioquia simply hands on the contract to them.

All of the PYMES are autonomous in terms of administration and budgets. Each of them have a head office in Medellín, which is responsible for the control and guidance of all of the systems which the company runs, with the exception of Presea, which has its head office in Bogotá. In addition, all of them have an office in each municipality where they operate. The mix of staffing for these offices varies, but most offices do all of the operational work, develop work plans, manage relations with municipal administrations, billing and collection, write preliminary financial reports, make deposits, and send the documents to the accounting section in the head office.

In addition, all of the companies, in common agreement with Acuantioquia, contract an external management and results auditor, and this same auditor supervises the contract with Acuantioquia. In the municipalities for which Acuantioquia is not responsible, they contract an auditor trusted by the local mayor.

1.4 Financing

The tariffs of each municipality are calculated according to a tariff formula issued by the Drinking Water and Basic Sanitation Regulatory Commission, CRA. The tariff system that the PYMES currently follow was established in 1997 by Acuantioquia. A transition period was anticipated to arrive at a target tariff in 2001, but this has now been postponed until 2005. Currently, the systems are making annual increases which correspond to the

⁸ 5 year contracts were only signed in Marinilla and Sonsón.

consumer price index, CPI, adjustments. A number of the municipalities have established a Solidarity and Income Redistribution Fund as a special account to grant subsidies to low income households.

The local offices need support in particular with replacement or large expansion works. The only option for financing such works has been the companies own resources generated from user charges.

1.5 Specialist support

A number of local managers have struggled, as in the Arboletes system which supplies water to a town of 11,000 inhabitants, with a great number of tourists. The system used is a rainwater reservoir in a region with low rainfall. The local manager believes that no one has helped him, *“no national, departmental or municipal entity has worked with me to face the emergencies that the system has”*.

However, most companies have been able to resolve these challenges. Listed below are the main technical assistance services demanded by the operators, and those that they supply:

- ***Efforts to reduce costs through conservation.*** In general, all of the offices try to do some kind of work with the communities to promote efficient use of water resources, and timely payment of the tariffs. Acueductos y Alcantarillados Sostenibles S.A.-E.S.P. considers that careful use of water, as well as lowering the charges to the user, also facilitates more sustainable use of the system. In some localities, the consumption per home has lowered from 25 m³ to 12 m³.
- ***Extending water sales and coverage.*** Extending the system and coverage requires investment, which is the responsibility of the owner, with co-financing by departmental and/or national governments. Reinvestment of revenue surplus is important, and to this end companies, through their local offices, are active in encouraging potential users to connect to the system.
- ***Integration of the company's strategies with local development plans.*** There is a continuous relationship between the local/head company offices and the municipal administration, in order coordinate with municipal goals for urban development. In this way, investments are prioritized. In addition, almost all of the companies have promoted implementation of water and sewerage master plans, which directly relate to municipal Land Use Plans and Development Plans.
- ***Support for municipalities in technical aspects and to obtain access to financing.*** Generally, the companies support the municipalities in preparing projects, and establishing co-financing. They also support them in project management and works supervision. When revenue surplus is used to finance works, the company is the one who invites tenders for the works. When the municipalities invite tenders, the companies support them with bid documents and advertising. In some municipalities, the company works as the mayor's consultant to resolve problems in the rural zone.
- ***Support for cooperation between communities.*** The companies are usually located in the urban area of the town, but there are cases, such as Segovia and Ciudad Bolivar,

where the company provides services to a rural area or where some system structures are shared with community aqueducts.

- ***Facilitating municipal relationships with other agents.*** The companies encourage the municipality to participate in all public meetings and events that take place, as it is the latter who legitimizes the model as a provider of a key public service.
- ***Education.*** Almost all of the operators highlight the importance of developing education programs with the users. Some of them consider it particularly important because they know that the community was not informed about their presence. Some companies have developed reforestation programs in the municipal area, with schoolchildren or community workshops to explain the legislation, user's rights, tariff composition, etc. When a conflict arises, all of the necessary authorities are informed, in order to find a solution as fast as possible. One of the biggest sources of conflict has been service payment. In some communities only 30% of the subscribers paid for the service, and with the work carried out by the companies, they have managed to reach between 85 and 90% of payments. As the companies are involved in such an essential municipal service, their participation is requested in important events for the municipality: sporting events, festivals in honour of the patron saint, etc.

1.6 Some advantages and disadvantages of the model

Advantages

- It is designed and successfully tested in a developing country.
- Asset ownership is still in the hands of the municipality.
- The Municipal Administration has regulatory control over tariffs, and approves them according to guidelines given by the Regulatory Commission.
- It neutralizes political interference in system administration through the contract with a private operator.
- It promotes infrastructure and performance improvements because profits come from good system operation.
- Tools designed for small towns' systems are being made more widely available, which allows it to take advantage of technological advances at reasonable prices.
- The operators have an ethic of providing a public service, but they are also entrepreneurs who know that business is about not just short-term, but also long-term planning.
- After two or three years of operation under normal conditions, it is capable of generating resources that allow it to support operation and maintenance as well as some investment, but not yet to finance all investment.

Disadvantages

- There remains some skepticism on the part of local authorities, and therefore legal and regulatory aspects need to be addressed which guarantee the permanence of the model as time passes.
- It is vulnerable given the violent situation currently experienced in rural areas of Colombia. Some municipalities, instead of having increasing subscriber numbers, are

losing them⁹ as the population is emigrating because of violence. In this way, the system starts to have financial losses, and the mayor could be sued by the operator to cover these losses.

- It requires that the community commits itself to paying for the service, which has been problematic in some cases.
- Regulations on tariffs that are appropriate to small town conditions are needed. These do not currently exist in the country, as the existing legislation uses big city conditions as its reference.
- It demands that the systems be in good condition, which was not the case when they were handed over, and that financing is found for necessary improvements.
- The private companies, which are a relatively new type of enterprise, lack the means of securing loans.

1.7 Next steps

In order to improve service to small towns the PYMES propose:

- The government take responsibility for financing system infrastructure improvement, in order for them to do their job as operators better.
- The establishment of management performance indicators and a benchmarking framework that allow for the operator's work to be valued.
- This kind of company requires regulation, technology, and systems software suitable for small towns. Some companies have taken up the challenge and are producing this kind of tool themselves, or in association with other companies.

1.8 Replicability

The existence of a legal and regulatory framework that clearly establishes the rules of the game for private participation is essential for replicability of the model. But the experience of the PYMES shows that the success of the model is not only a matter of the legal / regulatory framework; it is deeply related to the existence of a *management culture* based on values that aim to achieve effective and efficient services *with a social conscience*. There are regions that, because of their economic development, have a cultural base that facilitates the creation of this kind of companies, whilst in others, it may require extensive capacity building and consultation.

On the other hand, the operators recognize that the tariffs of the systems they operate are high for local users, and that to be able to lower them, there must be the possibility that the State will provide subsidies for large investments. This would mean that the percentage of the tariff assigned to investment could be reduced. In addition, the majority of the operators recognize that it is impossible to implement this model with less than 1,500 subscribers. For the majority of these local companies, the ideal size is between 5,000 and 7,000 subscribers, although the larger companies now believe that they can manage up to 100,000 subscribers.

⁹ As in the case of Mutatá and Salgar (1800 subscribers has fallen to 1600).

With regard to contract duration, the operators consider that they should be between 7 and 10 years in length, without investment on the part of the operator except for that generated by surpluses.

2.0 Acuavalle S.A. ESP, in the Valle del Cauca

The Acuavalle model is situated in the Valle del Cauca, a department with one of the highest levels of economic development in the country. Acuavalle is a public corporation which was established on July 16th, 1959, through an agreement signed by the legal representatives of the National Institute of Municipal Promotion (Insfopal), the Valle del Cauca department, and the Municipalities of Alcalá, Bolívar, Candelaria, Guacarí and San Pedro. It was created under a central government initiative to form regional companies which would be responsible for water and sewerage systems for each region or department.

In the 1970s and 80s, Acuavalle enjoyed fame in Latin America as a successful model. This fame was based on efficient technical management that was supported by investment resources from higher national and international levels. Therefore, the company was hard hit by Law 142, and the decentralization process which expected full cost recovery by public service enterprises.

Between 1999 and 2000, the Acuavalle model came into crisis, facing a choice between privatization and total liquidation. In addition to the reduction in State subsidies, high benefit responsibilities and a limited vision for development of its assets and commercial basis left the company unviable. *“...the company did not have a futurist vision of strategic planning that would promote its development through team work, and coordination with municipalities, the department, the nation and communities. Its actions were simply to offer services, and gain access to resources to carry out work, without considering technical, administrative, financial and technological development that would allow it to stay in the market. This situation and the work overload almost brought it to liquidation ...”* [Acuavalle Planning Deputy Manager, Cali.]

The liquidation agenda opened the floor to all members of the company to find a solution. The challenge was to show the national government that Acuavalle did not have to be privatized to be efficient, and could continue as a State Enterprise. A key part of the solution lay with negotiated settlements with the main labour union leaders and employees. This led to a concerted reduction in staff and workers renouncing benefits, through to a voluntary retirement plan, and an adaptation program to help those leaving as well as a program to introduce a culture of improved management for those who stayed on. This restructuring has sustained the company as a State Public Service enterprise, in which the Valle Government is the owner of 70% of the shares, and 33 municipalities in the department continue to be the main partners.

Acuavalle has gone from having a workforce of 525 employees to 326. Specialist companies have been contracted to begin implementing computerized information systems, as well as improved communication systems. But above all, what has been achieved is that all of the members of the company *“feel like they own it”* and work is

done in a spirit of cooperation between governmental authorities, (the Valle del Cauca Government), the board of directors, and the company's staff (union leaders and employees).

The restructuring process began to function in January 2003, with a consolidated administrative framework, from 33 section directors (one per municipality) to 10 regional directors. The municipalities have been grouped according to their geographic closeness into 10 AGUAS (Acuavalle Water and Sewerage Geographical Association) and each AGUA has a director. The impact of the changes is already being felt in financial terms, and for the first time in its 44 years of existence it has shared dividends with its partners.

The establishment of direct communication channels between the management, the partner municipalities, employees and users has played a large role in this process. The manager comments that: *"I've been to the places furthest away from Cali, el Cairo and El Aguila, and the operators have told me that in 20 years, a manager has never come here. In this office there are employees who tell me: in the time you've been here, I've been to management 15 times, and in the 20 years before that, I never went once"*.

2.1 Challenges

The main challenges in the Acuavalle restructuring implementation have been:

- Staffing issues relating to job profiles and salary curves.
- Relocation of employees who did not take the retirement plan, and their training for a culture of improved management.
- User orientation about the new administrative scheme.
- Resistance to change from some employees.

2.2 Key stakeholders

In the Acuavalle model, the most important relationships have been established with:

- the **Department Government** and the **Associated Municipalities**, as they are the ones who provide financial resources for carrying out works in the municipalities. This relationship has sustained the company during the entire period of time it has existed. The company, along with these authorities, has given itself the challenge of changing its "paternalist" attitude for a more proactive one, and encouraging an ethic of teamwork. Part of this change lies in the possibility of incorporating new staff with different skills and ideas to help institute the change process.
- Contracts are established with the **private sector** depending on specific needs the company may have. Currently, more services are being demanded in this sector, due to the restructuring process that the company is going through.
- The relationship with Asociación de Andesco as a **labor union** entity is also critical to manage staff issues.
- Under the new approach, **users** are placed at the center of all planning, as the main beneficiaries of the work carried out by the company.

The stakeholders who drive the model are mainly the Valle Government and the partner municipalities. However, in processes like the one Acuavalle is currently going through, key stakeholders are the management of the company, the Union and the company employees. The Governor of the Department has been important, as he has facilitated and promoted the process, limiting political interference, and leading the dialogue with central authorities so that the company would not be liquidated. “...*What we are doing here has been really very fast, and very successful because the governor has allowed me to act with total independence from politicians, and because the union has not asked for an exorbitant salary increase ...*” [Acuavalle General Manager]

It is important to note that the staff who wanted to contribute to the company’s restructuring agreed to forego their retirement pension, as well as additional salaries and company bonus. An agreement was also reached between the union and the company’s management so that the staff could retire after shorter periods of service.

2.3 Institutional issues

In the Acuavalle S.A. model, the main institutional agreements have been in place since it was founded 44 years ago as a regional company, based on contractual arrangements with the Valle del Cauca Government and the Associated Municipalities. The relationship with users is based on standard contracts, prepared in accordance with the norms established by the Drinking Water and Sanitation Regulation Commission.

Acuavalle S.A. operates in the Valle del Cauca with a head office located in Santiago de Cali and ten business units called AGUAS, which provide services for 33 municipal localities, 25 zones and 59 districts, which supply services to 128,653 users. Each AGUA is managed by a director who is accountable to the head office for all commercial, administrative, technical, and operative management of the AGUA. The head office carries out general administration, planning, technical support, financial reporting, and auditing duties. (See Annex C).

Population Unit	Water Supply		Sewerage	
	No.	Users	No.	Users
Municipalities	33	118,566	33	93,688
Districts	59	3,592	4	78
Zones	25	6,495	5	2,075
Total Users	117	128,653	42	95,841

2.4 Financing

The company is mainly financed with revenues from tariffs. The tariff is calculated by following the tariff setting methodology defined in Resolution 151 of 2001, of the Drinking Water and Basic Sanitation Regulation Commission. Other resources come from consultancy or specific service provision like billing in some municipalities in Valle.

The kind of technical assistance that the offices demand is essentially commercial, for tariffs, systems, operation and customer attention. It is financed with revenues from tariffs, and Departmental Government contributions. Other technical assistance financing options are the agreements signed with the National Apprenticeship Service, SENA, and national and foreign entities which grant training scholarships.

2.5 Specialist support

Within the company, the greatest demand is currently to be found in management training. Information management systems and network communications are also demanded.

The main technical assistance services demanded of, and supplied by Acuavalle S.A. are:

- **Efforts to reduce costs through conservation.** It is aimed to provide education on water conservation in particular through schoolchildren. *“...We’ve been training students from 10th and 11th grade in municipal schools, in educational days. They have to do obligatory social work experience and we want them to do that in water educational days. Another initiative is the Water Defenders Club, aimed at training kids as water defenders ...” [Acuavalle General Manager]*
- **Expansion of water sales and coverage.** Through the new business program, the demand for expanded services to other localities is being studied.
- **Integration of the company’s strategies with local development plans.** Through both departmental and municipal meetings, basic needs are defined, and investment activities and projects are coordinated with municipal Land Use Plans and Development Plans.
- **Support for municipalities to gain access to financing.** Through technical assistance and hydraulic modeling programs, investment projects are better defined. Financing is sought through agreements with the municipalities, the company and the department or national government. According to the source of financing, the company, the municipality or the department lead the tendering process.
- **Facilitating conflict resolution with the affiliated municipalities.** Acuavalle’s participation in public hearings¹⁰ is the strategy applied most often to facilitate conflict resolution with communities. The manager comments: *“....I’ve had to face a few mayors who completely deny the vision and presence of Acuavalle. I’ve been participating in public hearings in Sevilla, Alcalá, Dagua, Ginebra, Jamundí, in the whole Valle del Cauca. They used to blame Acuavalle for being a company that did not take people’s needs into account. Now this has started to change with better user service ...”*
- **Facilitating municipal relations with other agents.** Acuavalle finds the most suitable specialist technical consultants according to the problem in hand.

¹⁰ Municipal Council meetings in which citizens are allowed to participate.

2.6 Advantages and disadvantages

Advantages

- Economy of scale in town groupings, which allows for resources to be optimized.
- Management information at central level.
- It is promoted as a company that will offer consultancy services, as well as water and sanitation services.
- Backdating of employee pay, which is the largest responsibility that State companies face, has been negotiated in the restructuring process.

Disadvantages

- The current tariff regulation is inappropriate, and is applied to both big and small towns. In particular, Acuavalle operates in small towns fundamentally made up of medium and low income households.
- The process of municipalities voluntarily forming an AGUA remains contentious and with no clear guidelines.
- The political changes at the departmental and municipal level could affect the restructuring processes that are being carried out.

2.7 Next steps

To better support small towns, Acuavalle is working on:

- Developing a tariff modification proposal that involves coordination with the municipalities, and the department and the national governments, with the aim of establishing tariffs more in tune with the kind of users that the company serves (94% strata I, II, III).
- Technological changes and resource optimization to expand coverage and improve services.
- Expanding its business through consultancies and technical assistance in different departments. The Manager considers that “...*Acuavalle as a company could expand into other parts of Colombia, and Latin America, because we have 33 different municipalities in the whole Valle del Cauca, or rather, we have a market competition advantage that is managing a number of small towns, medium-sized towns, and the technology exists today so that you can deal with the information by Internet. This is where we’re headed, we’re not there yet, but we’re going in that direction ...*”

2.8 Replicability

The Acuavalle model is replicable wherever there is the potential for aggregated municipal management or the conditions that would allow it to be created. This model arose from a national government initiative supported with strong financial resources at the departmental level. However, consideration of the benefits that aggregation brings, such as economy of scale, sharing technical support, joint search for financing could motivate some small towns to experiment with an approach similar to Acuavalle.

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Annex A – Background to the legal and regulatory framework

In 1950, the national government founded the Small Town Public Works National Institute (INSFOPAL) to build, operate, maintain and run water supply and sanitation for the whole country. In 1954, the legislative act No 5 which created the notion of “decentralized institutes” not only strengthened INSFOPAL, but also made it possible for organizations of this kind to appear at the municipal and departmental level, such as the Valle del Cauca Water and Sewerage Company S.A. in Acuavalle, and the Antioquia Water and Sewerage Company S.A. (Acuantioquia).

Law 12 of 1986 initiated a decentralization process in Colombia, and its regulation decree 77 of 1987 delegated the responsibility for water supply and sanitation services to municipality level. The Colombian political constitution promulgated in 1991 ratified this responsibility, but established that service can be provided by the state, the private sector, or organized communities. It also created a technical organization, the **Public Service Superintendence** to control, inspect and supervise the companies providing these services.

Law 142 of 1994 created the **Drinking Water and Basic Sanitation Regulation Commission (CRA)**, which has responsibility for regulating natural monopolies, and economic competition, tariffs, service quality, and efficient management. It defined the user’s role in supervision of the ESP and created the option of forming **Development and Social Control Committees** in each municipality.

The CRA, through the issuing of Resolution 151 of 1996, established a tariff methodology which public service providing entities should apply. According to this, the tariffs should cover: *average administration expenditure*, (costs of administrative staff, administrative, measuring and billing assets, claims, insurance and taxes, contributions to the CRA and the Public Service Superintendence and general costs), *average operational and maintenance expenditure* (electricity, chemicals, electrical and mechanical maintenance workshops, equipment and tools, vehicle maintenance, spares warehouse, contracts with third parties for operational activities), and *average investment expenditure* (including gradual replacement of the system to ensure future service provision at the lowest possible cost, and expansion to meet increasing demand). Homes are classified into a maximum of 6 strata: I low - low, II medium – low, III low, IV medium, V medium-high, VI high.

Law 142 established a subsidy mechanism for low strata.

Annex B - Public Service Pymes in Antioquia and their coverage

Localities served	No. of inhabitants	Water	Drainage
		No. of Subscribers	No. of Subscribers
ACUEDUCTOS Y ALCANTARILLADOS SOSTENIBLES S.A. - E.S.P			
San Pedro de los Milagros	10.420	2.623	2.408
San José de la Montaña	2.725	697	522
Santa Rosa de Osos	10.143	3.842	2.989
Puerto Triunfo	3.812	720	606
Bolombolo	-	726	542
Armenia	2.035	1.126	513
Ituango	9.850	1.714	1.601
Titiribi	3.798	1.169	994
Venecia	5.360	1.668	1.367
Amalfi	9.734	2.768	2.452
Anori	4.571	1.154	730
Yali	3.829	928	748
Total	66.277	19.042	15.472
CONHYDRA S.A. –ESP			
Turbo	45.134	6.770	-
Sonsón	18.617	4.949	4.949
Marinilla	27.728	7.380	5.912
Mutató	3.835	806	-
Puerto Berrio	35.278	8.575	8.575
Chigorodó	42.689	5.706	5.706
Santa fe de Antioquia	13.666	4.143	4.142
Total	186.947	38.286	30.709
OPERADORES DE SERVICIOS S.A. –ESP			
Santa Barbara	19.305	4.089	2.177
Caramanta	4.095	895	773
Valparaíso	5.436	1.166	872
Fredonia	11.754	2.489	2.221
Total	40.590	8.639	6.043
INGENIERIA TOTAL SERVICIOS PUBLICOS S.A. –E.S.P.			
Andes	16.490	4.650	3.775
Ciudad Bolivar	16.340	3.985	2.968
Jardín	7.521	2.259	2.162
Salgar	6.440	1.808	1.020
Segovia ¹¹	37.905	4.620	-
Total	84.696	17.322	9.925
CONSORCIO AGUASCOL			
Caucasia	75.000	9.947	6.282
Taraza	20.000	2.301	1.829
Henchí	9.600	1.269	-
Cáceres	8.000	846	727
Total	112.600	14.363	8.838
PRESTADORA DE SERVICIOS DE ACUEDUCTO, ALCANTARILLADO Y ASEO, PRESEA S.A. –ESP			
Apartadó	81.687	7.186	4.379
Total	81.687	7.186	4.379
SISTEMAS PUBLICOS S.A. E.S.P			
Necoclí	10.128	1.570	772
San Pedro de Urabá	10.420	1.734	1.203
Total	20.548	3.304	1.975
CONSORCIO FRANCISCO VELASQUEZ			
Arboletes (approx figures).	11.000	2.200	1.400
Istmina (Chocó)	9.000		
Tadó (Chocó)	7.500		
Total	27.500	2.200	1.400
SUBSCRIBERS GRAND TOTAL	623.156	95.254	64.175
POPULATION SERVED		464.290	314.455

¹¹ Operates through a contract with the municipality

**Annex C - ACUAVALLE S.A. Water and Sewerage Geographical Associations,
AGUAS**

AGUA	M/TIES	USERS	SECTIONS						LOCAL OFFICE
1	3	8,823	BOLIVAR	EL DOVIO	ROLDANILLO				ROLDANILLO
2	3	4,841	DAGUA	LA CUMBRE	EL CARMEN	VIJES			VIJES
3	5	8,783	SAN PEDRO	YOTOCO	RESTREPO	RIOFRIO	TRUJILLO		YOTOCO
4	5	12,694	ALCALA	ULLOA	OBANDO	LA VICTORIA	LA UNION		LA UNION
5	5	7,065	A/NUEVO	ARGELIA	EL CAIRO	EL AGUILA	TORO		ANSERMANUEVO
6	2	13,531	CAICEDONIA	SEVILLA					SEVILLA
7	1	14,074	JAMUNDI						JAMUNDI
8	3	15,103	GUACARI	SONSO	GUABAS	GINEBRA	EL CERRITO	S/ HELENA	EL CERRITO
9	3	13,313	ANDALUCIA	B/GRANDE	EL OVERO	ZARZAL			ZARZAL
10	3	20,339	FLORIDA	PRADERA	CANDELARIA	SAN ANTONIO			PRADERA
TOTAL	33	118,566							

**Town Water Supply and
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WSS Service Provision in Colombia**

Case Studies

**Companion Paper C4
Annex**

**Mariela Garcia
July 2003**

The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and should not be attributed in any manner to the World Bank, to its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent.

Specialist Support Options Study

A Comparative Study of Market Consolidation and Aggregation in WSS Service Provision in Colombia

CASE STUDIES

Mariela García V.
with **Luis Alfredo Loaiza and Alfredo Vanín¹**
CINARA, Universidad del Valle
July 2003

CASE STUDY 1

Municipality of Marinilla

Specialist operator: Conhydra S.A. - ESP



Context

Marinilla is a municipality located 45 minutes from Medellín by road. It has 27, 728 inhabitants in the urban area, its area is 115 km². The average temperature is 17°C. The municipality is a cultural center in the west of Antioquia with high historical value. It is a very religious town, and conserves cultural traditions.

The water and sewerage system has been managed by CONHYDRA S.A. – E.S.P. since 1997, after a tendering process opened by the company which owns the system, Acuantioquia S.A. E.S.P.

The beginnings of the private operator's participation are summarized as follows by the mayor, Dr. Juan Manuel Ochoa Giraldo: *"...In Marinilla there was a large protest because Acuantioquia never consulted us, but rather they came and told us. This protest movement was headed by the municipal administration, the honorable council and various leaders who had been organizing for the town to break links with Acuantioquia because it was inefficient. It was possible to agree with the departmental government, Acuantioquia, the private operator, and the municipal bodies that the contract would be signed for only five years, extendable at the parties' discretion, with previous evaluation of how the service provision and management by the private operator had gone for us. Fortunately, in Marinilla it has gone very well"*

The whole town has a household connection. The water system has 7,380 subscribers with 100% coverage, and the sewerage system has 5,912 with 92% coverage. It owns a drinking and waste water treatment plant. The average unaccounted water value was 37.6% for the year 2002 and with the micro measuring management carried out in June 2003, the average lowered to 34.0%. The service is provided 24 hours a day.

¹ A complete list of acknowledgements is included at the end of the paper.

INGREDIENTS FOR SUCCESS

The factors which are considered key for different management model are analyzed below. However, this does not necessarily mean that each one carries a lot of weight in this case.

1. FINANCIAL AND MANAGERIAL AUTONOMY

The Conhydra local office has an operative manager who is a sanitary engineer, and is responsible for the 19 employees that the office employs (a rate of 2.6 employees for each thousand subscribers). It also deals with all local management but national level negotiations are carried out by the general manager. This office manages the system's account, pays salaries, the suppliers, taxes, in general, all of the costs that the systems generate. The operator's salary is sent to the office in Medellín as are the payments that are generated from the technical assistance that this office provides them.



Acuantioquia, as owner of the system, does audits on the resources collected and authorizes the investments that are made for the system based on the surplus. All of the accounting is processed in Marinilla, but there is a general accountant in the Medellín office who revises and gives approval.

Company staff control. The Medellín office has a Human Resources leader who directs the company's staff management. Since 2002, they have begun to implement an evaluation which has been named 360 degrees, because each one of the employees is evaluated by their line manager, a work colleague, by themselves and by a client.

Stakeholders support . The support from the local government has been key for the operator's performance. The Mayor comments: *"the operator and the municipal administration have built a strategic alliance to obtain resources, and for developing infrastructure work"*. The Control Member states that *"at the moment the population is very happy with the water service, but we do have lots of problems with the high cost of electricity"*.



There is a user satisfaction survey carried out every year. In 2002, of 757 people surveyed, only 5 people were unsatisfied with the service, or less than 1%. The taking of the survey is coordinated by a group made up of: local legal authorities, the Development and Social Control Committee, and a community representative.

Each year the company receives 25 students (men and women) from tenth grade in local schools to do their community service. These students are trained for two months after which, identified with a T-shirt and cap given to them by the company, they make home visits to users to support them with fixing damages, detecting leaks, knowledge of public service legislation, etc.

Political interference in the operator's management. At this moment, the Marinilla operator is not threatened by politicians. A report is presented annually before the Municipal Council. During

mayoral election periods, an open attitude has been taken with all of the candidates, as the company has a policy of maintaining political neutrality, and is committed to supporting the management of whoever is elected, no matter which party they may belong to.

Tariff calculation. The Marinilla tariffs were calculated by Acuantioquia, based on the methodology designed by the CRA before the operation contract was signed. In 2001, when the government announced that the date for ending subsidies was 2003, a tariff adjustment plan was made. The company elaborated three scenarios in which the effects of lowering the subsidy to 30% for strata I, 20% for strata II and 10% for strata III were shown. The Mayor analyzed the different proposals and chose the most suitable for the community, which was presented for approval to the Superintendence and the Regulation Commission. The government later postponed the date to 2005 and adjustments have not been made again. Each year the adjustments that are authorized by the Regulation Commission, in accordance with the CPI, are made.

Billing. During 2002, 97,772 m³ of water per month were billed in Marinilla. The local office feeds the InterFASP program, version 1.0², entering the meter reading information, payment and charging. This information is sent on a CD-R to the Medellín office. GESCOMER, a specialist firm with which they have an agreement, revises the information to detect inconsistencies (which must be corrected by the Marinilla office) and prints the bills. It only takes one and a half day between the arrival of the information in Medellín, and the preparation, and printing of the bills.

User connection. In the year 2002, 161 new subscribers were connected, which is linked to population growth. Connections are made by company employees, and the connection fees are linked to the strata as follows: strata I \$97,660 (US\$ 34.45)³, strata II \$157,942 (US\$ 55.72), strata III \$188,097 (US\$ 66.35), strata IV \$248,558 (US\$ 87.68), and strata V \$313,109 (US\$ 110.45) and industrial, commercial and official contracts \$308,645 (US\$ 108.87). Until now there has been no volume which would require contracting out this activity to specialist companies.

User disconnection. As it is a procedure directly related to commercial management, it is carried out by staff directly linked to the company, and the circumstances are taken advantage of to educate the user. The aim of the company is that the user be connected.

System investment and means of financing. Since the linking of the specialist operator until June 2003, investments have been made in the system which go up to \$5.000 million pesos (US\$ 1.763.668), as a result of joint search for financing between the local government and the company, with the investment plan for peace, part of Plan Colombia, the Corporación Autónoma Regional Rionegro-Nare, CORNARE, the Development Ministry and the investment of the tariff charge surplus. The Mayor believes that “for each \$100 (US\$ 0.035) that the Marinilla users have paid, they have been given \$109 (US\$ 0.038) back in works”. These resources have been invested in the master plan formulation, water and sewerage network replacement, construction of the waste water treatment plant, etc.

The investment that CONHYDRA makes with the surplus are destined for key sectors that require urgent attention (sections of the water and sewerage networks, improvements to the drinking water plant, or the waste water treatment plant).

² Taking into account the lack of commercial management tools for small towns, CONHYDRA associated itself with DINFO Ltda. (software manufacturers) to produce InterFASP 1.0, which facilitates management of the commercial part of water and sewerage services. These two businesses, accompanied by Consultores y Asesores Gabinete Ltda. gave rise to a new company, GESCOMER.

³ An exchange rate of Col\$2835 per dollar is used in this study for the second quarter of 2003.

In the case of new urbanizations, that need to build their services infrastructure, work agreements have been established in which the urbanizer buys the material, the municipality provides the machinery and CONHYDRA contributes with qualified labor.

Financial viability of the company

Although it showed a loss in 2002, the cumulative total of the water and sewerage system of the municipality of Marinilla, shows a surplus in activities from previous periods. In 2001, the utility margin reached 12%, a significant value in the sector, and this strengthened its assets. In 2002, there was a rise in production costs, especially in material purchase, which affected all of the utility of this period, but in the short term, this could mean improvements in service provision, and coverage. The period loss is also affected by external demand which the workers of the company that owns the system (Acuantioquia S.A.) presented, and which fell in this period for accounting purposes. Although liquidity fell in the last year from 1.4 to 1.0, the company is capable of meeting its obligations on time.

With the previous analysis, it can be deduced that the Marinilla system is financially viable, but it must try not to increase production costs.

Financial Indicators	Year 2002	Year 2001
<i>Current Liquidity</i>	1.0	1.4
<i>Utility Margin</i>	- 10.7 %	12.1%
<i>Debt Structure</i>	100%	100%
<i>Cost Covering</i>	0.9	1.13

2. TRANSPARENCY AND RESPONSIBILITY

In the Marinilla office, transparency is understood as acting in a fair way with all parties (user, contractors, the company), or rather, that there are no advantages for anyone, just that the work gets done so that everyone can earn fairly.

In addition, great importance is given to presenting information. A consolidated report is prepared annually about technical, administrative, and financial behavior, which is presented in February of each year to the Municipal Council, the Mayor, the Personeria⁴, and the Development and Social Control Committee. The company requests the appointment to present it, it does not wait to be called to account for itself.

For communication with users, the company employs various means:

- Campaigns.
- Home visits by company employees, and Committee members who prepare the satisfaction survey, to users who are unsatisfied with the service to discover the reason for their dissatisfaction and solve their demands.
- Flyers to give information about the tariff re-evaluation which is made every 3 months to adjust the tariffs to the CPI.
- Educational messages on the back of bills.
- Announcements by megaphone when matters like suspending the service are involved.

⁴ Governmental office for civil rights protection

- Information videos. Videos are shown while waiting to pay for services in the office.

Responsibilities. The company is responsible for the operation, administration and maintenance of the system. Users have their responsibilities established in the Standard Conditions Contract, which has been elaborated following the Colombian legislation outlines.

As the local government is not the system owner, loans cannot be made using the infrastructure as a guarantee. Therefore, many negotiations have been made to obtain resources which allow optimization work to be carried out. Recently, the Solidarity and Social Redistribution Fund, with subsidies for strata I, II and II, has been created. Although the Mayor believes that the majority of small towns are not capable of taking on those subsidies⁵, Marinilla has made significant efforts to pay the equivalent of the first four months of 2003.

Auditing and Social Control of the Operators. Acuarioquia charges the systems to contract external companies that audit all of the accounting work. This work is carried out in the central office in Medellín.

The annual reports the operator writes are presented to the Marinilla public service development and social control committee. This committee deals with user complaints, sees that the operator solves them and participates in design and follow-up of the annual satisfaction survey.

Although the operator is a private company for administrating public resources, the management reports and system financial statements are available for public consultation.

3. PROFESIONAL SUPPORT

Staff is selected through public notification in which the requirements wanted are detailed, and contracts are given to those who obtain the best results in the exams which the candidates sit.

The company takes advantage of formal and vocational education courses existing in the region to train its employees. The operational manager is studying a diploma course in management at a university in the region. The operative and network staff has been trained through the certification program offered by the National Apprenticeship Service, SENA⁶. Part of the administrative staff have also studied at this institution.

In addition, each year the company brings together all of the operational managers of their systems for two days in Medellín. As well as discussing general office matters in their charge, they are trained in leadership issues during this time.

In the documentation process to achieve certification, a procedure harmonization program was developed, with the advice of an external consultancy firm. Conhydra S.A. was certified under the norm ISO 9001, version 2000.

Within the company, professional support is received from the Medellín office, and staff located in other municipalities who serve the company when necessary. The general managers only approach other operators to face specific problems.

⁵ The master plan of the municipality costs \$6,000 million pesos (US\$ 2.116.402) and Marinilla's annual budget is \$9,500 million pesos (US\$ 3.350.970) to meet all needs.

⁶ The Sena is the entity in Colombia with responsibility for technological training.

4. LEGAL FRAMEWORK AND REGULATION

Law 142 of 1994 defines the principles for participation of the private sector in public services. But this law is more directed towards conditions in big and medium-sized cities. Observing the regulations in force is expensive for small municipalities.

Management of water resources is in the hands of the Regional Autonomous Corporations, and the company paid \$2,259,360 (US\$ 797) in 2003 for a volume of 180 litres per second of water to the Regional Autonomous Corporation Rionegro Nare, Cornare.

For a system like Marinilla which barely maintains itself in balance, it is difficult to pay \$9 million pesos (US\$ 3,174) monthly in polluter-pay rates. Marinilla has accumulated a liability of \$213 million pesos (US\$ 75,132) for this reason in the last two years.

The system performance comparing process is carried out within the company, or rather with the systems administrated by the company. Specific areas are compared, for example, costs for chemical consumption, attention for clients, system investment, etc.

5. COMPETITION

The operating company has the monopoly on service administration. All of the town has a household connection, and the only competition to the system is sale of bottled water in all commercial establishment, but, because of its cost, it does not constitute a supply alternative.

Colombian legislation has opened the space for the private sector to participate in public service supply, but clearer policies are needed to allow for the model developed in Antioquia to be consolidated. The latest contracts that have been promoted by central government have been oriented towards the figure of the Operator-Manager, where high levels of investment are demanded that the PYMES are not capable of delivering.

The Antioquia PYMES function with 15 year contracts, but in Marinilla, the contract was only granted for 5 years. Acuantioquia has been granting 6 month extensions, but because the Council is in a negotiation process for the water and sewerage systems, they have been unable to decide on a price.

The operational manager considers that given the state of obsolescence in which the system was found, 8 years will be needed to stabilize it. They have already been working for 6 and a half years, and it is thought that they have managed to stabilize the system to between 70 and 80%. For this reason, it is thought that the contract should be at least 10 years long. When the systems are not in good condition, the first three years are invested in trying to carry out pre-investment studies.

As regards input purchase, the market offers very little, meaning that the best prices are not obtained through competition between suppliers, but through discounts for volume and payment on time.

6. DEMAND RESPONSIVENESS

The specialist operator received a system that had already functioned for several years, and 5,880 subscribers. During the administration period, the number of subscribers has reached 7,380 (a 4.3% annual increase in 6 years), a figure that includes dealing with service demand in new urbanizations in the urban zone. Various mechanisms exist so that users can report their worries. They can go directly to the office, or do so through the students that carry out the Social Service Program, the Supervision and Social Control Committee or the customer satisfaction survey.

The PYMES model is open to free competition before the contract is signed. Any company which considers that it meets the conditions can participate in the tendering. Once the contract has been signed, free competition is no longer the case.

7. INCENTIVES FOR EXPANSION

At the end of 1997, and the beginning of 1998, Marinilla increased the volume of its aqueduct, by constructing a new intake in the La Barbacoas stream. This work guarantees the necessary supply until the year 2020. The municipality's current storage capacity will withstand between 4 and 5 more years.

All of the investments have been generated by the municipality in coordination with the operating company. Although credit lines exist in the country for this kind of projects, such as Findeter or the Antioquia Development Institute- IDEA, these sources have not been used in Marinilla. Generally the approval procedures are slow and the municipality lacks support as it is not the infrastructure owner.

Having a water and sewerage master plan has served to speed up co-financed project execution, because the licenses and permits remain approved for the active duration of the project.

Specialist operators are not authorized to expand the systems, but as their income increases as the coverage gets better, this becomes an incentive for promotion the extension that only the owner of the system can carry out.

8. OTHER INGREDIENTS FOR SUCCESS

Good relationships between the operator and local government. The mayor of Marinilla and the Operator bestow an essential role for the success of the PYMES model in this locality on the good relationship that has been built between both parties. According to the Mayor, in practice, they have been able to make a strategic alliance which has facilitated obtaining resources for development of infrastructure work. This includes a flexible position on behalf of the operator which has allowed him to perform different roles in project development: manager, auditor, works direction, etc.

The Mayor of Marinilla highlights that, in order to successfully establish a similar model, it is necessary that:

- The municipality acquire ownership of the water and sewerage system.
- The municipality have clear criteria for selecting the operator very well.
- Contracts are not made for more than five years.
- A strategic alliance is established between the municipal administration and the operator.

9. EVALUATION OF INGREDIENTS FOR SUCCESS

Ingredient for success	Rating from zero to five (five is the highest rating)	Reasons
Financial and Management Autonomy	3.5	The local office has autonomy to administrate the system, but important decisions must be consulted with the central office, and the owner of the system.
Competition	2	This model only promotes competition between the suppliers, at system administration level, it is a monopoly.
Demand responsiveness (including service to low income households)	4	The company promotes the joining of the largest number of subscribers but there is not a special program for low income households.
Incentives for expansion	3.5	Coverage expansion is a basic element to increase the operator's income. In this model, the operator depends on the system's owner for investment to be made, but in this case the operator has supported investment resource management and the locality shows a good rate of population growth.
Professional support	5	The local office trusts that the central office will give professional support, and if it does not have what is needed, it is contracted on the market.
Regulation	3	The regulation needs to consider the situation of small towns, and have a poverty focus.
Transparency and responsibility	5	The case has been successful because the municipal administration and user are satisfied and support it.
Good relationships between the Operator and Local Government	5	In practice, they have made a strategic alliance that has taken the system forward.

CASE STUDY 2

Caramanta Municipality

Specialist Operator: Operadores de Servicios S.A. – ESP



Context

Caramanta is a municipality located in the south-east of the Department of Antioquia, 117 km. from Medellín by a road that is 90% paved. It is at 2.600 meters above sea level, and has an average temperature of 17 °C. The population rises to 4,095 inhabitants in the urban area.

Founded around 450 years ago, and recognized as a municipality in 1842, Caramanta represented the starting point for Antioquian colonization first towards Caldas and then towards what is now the Valle del Cauca. Maybe due to its relative isolation, it conserves many legends and myths from the Antioquian cultural past. The town celebrates the Ruana (type of poncho) festival each year, with which it pays homage to a garment which is symbolic of Antioquian culture. Its architecture conserves essential traces of the past, which,

combined with its mountainous surroundings, gives it great potential for eco-tourism.

It is basically an agricultural and cattle farming town, in which the coffee recession has been causing crop diversification, and has discouraging demographic changes, as it has negative growth. By luck, a young administrative team is developing alternative employment programs which have attracted international attention. At the moment, it has the record for the youngest mayor in the country, elected by a civic movement.

The water and sewerage system has been administrated by Operadores de Servicios S.A.–ESP since 1997. The system's ownership is in the hands of Acuantioquia S.A. The system has 895 water subscribers with household connections, and 773 sewerage subscribers. It also has a direct filtration drinking water treatment plant and the system operates 24 hours a day. The system is very vulnerable as 60% of it was built with cement asbestos; its unaccounted water value is between 40 and 42%.

INGREDIENTS FOR SUCCESS

The factors which are considered key for different management model are analyzed below. However, this does not necessarily mean that each one carries a lot of weight in this case.

1. FINANCIAL AND MANAGEMENT AUTONOMY

Operadores de Servicios S.A. - ESP has a central office in Medellín and an auxiliary office in Caramanta. The central office is made up of a manager, a technical consultant, an administrative director, a commercial department coordinator, a human resources coordinator, and a technical director. The Caramanta office is the responsibility of an administrator from the region, a commerce student who has completed a year and a half's study of business administration, who carries out the

collections. A caretaker and five plant's operators, coordinated by the zone engineer, complete the workforce of local staff.

The company makes investments in the water and sewerage systems with the surplus generated by the system. The mayor says that *“the repairs that have to be made to the system are done pretty much by the operator alone”*.

Company staff control. The staff directly depend on the Medellín office, and are controlled by the manager and human resource department along with the financial and administrative direction. The latter are also responsible for planning staff training and selection processes. Each area is responsible for evaluation and follow-up of its respective employees.

Stakeholders support. The largest source of support has been generated in the company-community relationship, as there is not a large amount of contact with the municipal administration. Relations are cordial, but punctual; for example, the local government can borrow the dump truck to transport materials, when there is serious damage, or the company can act as consultant in technical issues for the mayor in order to solve water problems in rural areas.

The users show a growing level of satisfaction according to the evaluation surveys that the company takes every six months via a contract with external staff. These surveys are applied to a sample of 18% of users. To a great extent, these results are the fruit of consciousness raising work carried out by the company's social team and the transparency with which the accounts are presented.

In some sectors, complaints have been made about the cost of charges, and are fundamentally based on the population's low income. At the start of this year, a user encouraged the population not to pay, and went to the Public Service Superintendence to complain about the high tariffs. The Superintendence answered that the tariffs were adjusted according to legal regulations.

The activities that the social team carries out in the locality go from support in local festivities, and water use consciousness raising to training of certain sectors of the population (women and young people) in gainful employment.

Political interference in the operator's management. At the start, there was significant conflict with local political power, due to the fact that, in the system's previous administration, the councilors exercised the spoils system for themselves and their protégés, in order to avoid paying for the water service. The situation was tense, but little by little, they came to understand that the system had passed into private hands, and that financial success and good service depended on tariff payment.

On the other hand, as the current National Development Plan has the basis that the charges for socioeconomic strata I, II and III should not rise more than the CPI, the tariff adjustment plan application has been pulled back for this reason. This plan had defined targets to exceed the tariff surplus in December de 2005.

Tariff Calculation. The tariffs in Caramanta were calculated by ACUANTIOQUIA, before signing the operation contract, and were based on the methodology designed by the CRA. In 2001, when the



government announced that the date to end subsidies was 2003, the company made adjustments to the tariffs. The government later postponed this date to 2005 and adjustments have not been made since then. Tariff adjustment is only made in accordance with the CPI accumulation when the CRA authorizes it. Strata I currently has a basic charge of \$5,000 (US\$ 1.76) for water and sewerage and strata three \$8,000 (US\$2.82). There is no subsidy plan.

Billing. The caretaker does the meter reading on the 17th of each month. The company FACTUSISTEMAS, with whom Operadores de Servicios S.A.-ESP has signed a contract, sends a list from Medellín which is filled in and sent with the respective codes for completing billing. This information is compared in the Caramanta office with that of the previous month to check for possible errors.

User connection. This is done directly with company staff. The costs are fixed. Until now they have not had a volume whose size has made it necessary to contract this work out to specialist companies.

User disconnection. For the disconnection process to begin, the user must have let payment of three bills accumulate. Initially, the user is offered financing options and if they choose not to take them up, then they are disconnected. The user continues to receive the bill for six more months, with the basic charge, and then they are informed that the system will be cut off, which includes the removal of all connections, including the meter, and notifying them about the account that is still pending with the company. The number of disconnections is relatively high, given the low capacity for paying of many users.

System investment and means of financing. With the surplus generated by the part of the tariff which is designated for investment, Operadores de Servicios S.A. carries out small water and sewerage system optimizations. Activities like sectoring the system, which has allowed for more than 25 valves to be installed, which mean they can make repairs without having to cut the whole town's water off, have been prioritized.

The study of the Water and Sewerage Master Plan which was made in 2002 by the municipality, with technical support from CORANTIOQUIA, cost \$110 million pesos (US\$ 38.800), but as yet, it has not been possible to execute it. Caramanta has not demanded system expansion, and it is not necessary to update it because the population has not undergone any considerable change nor increase.

Financial viability of the company

According to the information given by Operadores de Servicios S.A. ESP, it can be assumed that the system is sustainable as long as there is careful administration as regards income generation and collection, and cost control.

The analysis carried out for the years 2001 and 2002 showed the following: liquidity is around 1, with a normal indicator being 2; the utility margin which should be at least the inflation rate, went from more than 1.6% (2001) to -2.5% (2002). Debts are very low (8.8% for both years). If indicators like debt structure are analyzed, this is always 100% given that the liabilities total is short-term. The cost covering index is around twice the operation and maintenance costs, which is very favorable.

Financial Indicators	Año 2002	Año 2001
Current Liquidity	0.75	1.07
Utility Margin	2.5%	1.6%
Debts	8.81%	8.76%
Debt Structure	100%	100%
Cost Covering	1.99	2.19

2. TRANSPARENCY AND RESPONSIBILITY

For Operadores S.A.- ESP, transparency means acting honestly and obeying the law. In addition, the employees believe that an operating company should not be exclusively based on earning money, as it works with community health and welfare. For this, great importance is given to information socialization, and to system appropriation by the community.

Unfortunately, the Development and Social Control Committee is not functioning. Attempts are made to solve complaints and claims at the office, but if this is not possible, they are reported to Medellín, from where an employee is sent to deal with the case.

The company uses various means to communicate with users:

- Permanent radio campaigns, taking advantage of the neighboring municipalities' stations: Radio Santa Bárbara and Antioquia Stereo. These radio programs are named "Operenvironment".
- Educational messages on the back of bills.
- Announcements by megaphone in association with the local parish.
- Sanitation and Drinking Water students from the National Apprenticeship Service (SENA) give training every Saturday to different community groups; taking them to the plant, raising consciousness about water resources, how to read bills and about the purification process. Sometimes they join with the Firefighting Force, and old age groups.
- Carrying out satisfaction surveys.

Responsibilities

The company is responsible for operation, administration and maintenance of water and sewerage systems.

The local government has not been able to set up a Solidarity and Income Redistribution Fund, and is not capable of taking on legal subsidies.

The mayor is aware of the company's investment difficulties, but claims that it does not have a budget to invest in the system. As the municipality is not the system owner, loans cannot be made with the infrastructure as guarantee. The company could do it, by mortgaging collection resources, but needs a guarantee that neither the municipality or ACUANTIOQUIA can offer it.

Auditing and Social Control of the Operators. Each six months an internal audit is carried out by the coordinators of the different dependencies, based on the ISO 9.001, version 2000, because the company is certified. Financial auditing is contracted by ACUANTIOQUIA, and is carried out

monthly. Management and result auditing is contracted by Operadores de Servicios S.A. –ESP and is carried out annually with the company Caro Consultores Ltda.

All users have the right to request the information they wish in writing at the central office and which is answered from there.

3. PROFESSIONAL SUPPORT

The staff are contracted by Operadores de Servicios S.A.'s central office. It initially functioned with ACUANTIOQUIA employees, and after they were evaluated, some continued and some left.

The company occasionally contracts training courses on: operation and maintenance, client service strategies, leadership and community empowering, in which all employees participate, including the staff employed in Caramanta. The suppliers also offer courses to train the company's operative staff in use of the equipment they sell.

The company has a permanent consultant, who supports them in aspects of quality improvement, business projection, and legal issue updating.

The Caramanta office receives professional support from the Medellín office, and from staff located in other municipalities which the company serves. There is a lot of exchange between the municipalities where the company operates on technical issues, and with other companies in the region. For example, if building work is being carried out, and they do not have experience with structures, experts from other companies are contracted, and Operadores de Servicios equally gives support in the areas in which it is strongest.

4. LEGAL FRAMEWORK AND REGULATION

The employees consider that the legal framework is not particularly beneficial for the PYMES. This was evidenced at the last ANDESCO⁷ congress that was held in Cartagena, which the engineer who technically coordinates the company attended. The congress was fundamentally directed towards large companies. The legislation, according to her conclusions, leaves small and medium-sized operator companies out. The cases of towns with 1.000 subscribers who barely managed to stay afloat must be studied, and individual cases and economic capacity of the municipalities must be considered.

The Central Antioquia Regional Autonomous Corporation, CORANTIOQUIA, manages Caramanta's water resource, and the company pays this corporation \$ 296.820 (US\$105) every six months for water.

In the south-east of Antioquia, not all of the municipalities have started to pay the polluter-pay rates. CORANTIOQUIA is programming to begin charging it in Caramanta in the first six months of 2004. The company fear that the cost will be very high because of the municipality's high organic contamination charge, due to numerous pig farms and horse stables.

For quality standards, the indicators adopted in the ISO 9001, version 2000 certification process, are used.

⁷ Colombian Public Service Enterprise Association

5. COMPETITION

The company has the monopoly on service administration in the locality, and its contract is for 15 years. On the other hand, the employees consider that there is no competition between the PYMES, and, in contrast, there is a certain level of cooperation, although they have not been able to organize themselves.

There is a good offer in the market for tube purchase, and better prices are obtained by buying directly from the supplier. But the sale of treatment inputs is a monopoly.

6. DEMAND RESPONSIVENESS

The Caramanta water system was constructed more than 30 years ago. Since Operadores de Servicios S.A.-ESP took over operation, very few new users have connected to the system, but the company admits that innovations and coverage expansions could be easily made. Community members believe that the service has improved since the company got involved with its operation.

Amongst the biggest achievements in the Caramanta system, the employees note:

- Improvements carried out in the treatment plant, (fencing, installing and painting the laboratory, for physical-chemical, and bacteriological follow-up).
- Consciousness raising in water use for human consumption, which was used before to water gardens.
- Micrometer replacement.
- Installation of a macro meter to measure and control loss of water supplied to the community, with a cost of 4 million pesos (US\$ 1,411).

In Caramanta, there is a laboratory that processes bacteriological samples that the operators routinely take each hour in the plant affluent and effluent. In the neighboring town, Santa Bárbara, Operadores de Servicios S.A. -ESP has a laboratory that is part of the “*Health Ministry laboratories analytical intercalibration test system*”, in which they do the physical-chemical analysis of all of the systems in municipalities served by the company. The results obtained are reported monthly to local sanitation developers, and to the Public Service Superintendence. Additionally, counter samples are taken and sent by the company to the Universidad de Antioquia laboratory and by the developers to CORANTIOQUIA. For greater control, the results are later compared.

When there is serious damage, supernumeraries are contracted or the company looks for support from community members.

The company considers that a lot of progress has been made in the six years they have been operating the system, despite investment limitations. On the other hand, financial management in an operating company is not simple, mainly due to the fact that their product is related to community health, and therefore, it is not simple accounting, but rather a complicated management process. They affirm that, by luck, they have an ideal team of staff.

7. INCENTIVES FOR EXPANSION

Caramanta' source is situated three kilometers from the treatment plant, and is sufficient for supplying the population in the future. It is processing approximately 7 liters per second, with the capacity to increase to 22 liters per second, according to demand. Both the plant and the storage tank have space for expansion.

The Master Plan considers various sources to widen collection in the future. One of the options foreseen is paving the final stretch of road for Caramanta to become less isolated, and then its population would begin to grow, which would generate higher demand. An external resource alternative would have to have already been obtained in that case, because currently, according to the mayor, *“the town is in a fiscal adjustment plan with the Housing Ministry. This does not authorize new loans for us until we pay off or are halfway through paying off the adjustment loan”*.

8. OTHER INGREDIENTS FOR SUCCESS

Water and sewerage administration transfer without trouble. Although the system handover was limited to a quick inventory, without considering its condition, there have not been clashes with the user community and the private operator, but rather, they have maintained cordial relations since the company began operations in the municipality.

Social work aimed at creating a community network. The company has driven participation with responsibility and transparency, and has been directed towards making the users feel that the system is the property of the locality's inhabitants, and not the service providing company. The initial lack of coordination has been rectified in this way.

9. EVALUATION OF INGREDIENTS FOR SUCCESS

Ingredient for success	Rating from zero to five (five is the highest rating)	Reasons
Financial and Management Autonomy	1	The local office is dependent on the central office.
Competition	2	This model only promotes competition between suppliers, it is a monopoly at the system administration level.
Demand responsiveness (including service to low income households)	2	Population demands are zero because growth is negative, and there is no special program for low income households.
Incentives for expansion	1	Caramanta does not have population increase, therefore the company has no incentive to expand the system.
Professional support	5	The local office trusts that the central office will give professional support, and if it does not have what is needed, it is contracted on the market.
Regulation	3	The regulation needs to consider the situation of small towns, and have a poverty focus.
Transparency and responsibility	5	The case has been successful because the users believe in the company.
Other Ingredients for Success:		
Transfer without problems	5	Lack of initial conflict between the operator and community has influenced mutual understanding.
Social work	5	There has been constant social work in the community from the company.

CASE STUDY 3

Agua No. 7 – Municipality of Jamundí ACUAVALLE S.A.



Context

The municipality of Jamundí is located in the south of the Valle del Cauca department, at 24 km from Cali. It is situated at a height of 975 meters above sea level and has an average temperature of 23°C. Its area is 655 km² and has a population of 62,846 inhabitants.

It was converted into a municipality in 1885. In geographical terms, the main part of the territory is flat, with some mountainous zones that reach 4200 meters above sea level. The territory is crossed by several rivers and it has a high urban growth rate, because of the construction of new urbanizations as it is the place of residence of people who work in Cali.

The water coverage is 100% (14,074 subscribers) and sewerage is 98% (12,539 subscribers). In the new Acuavalle structure, Jamundí, as it is one of the largest municipalities in Valle, constitutes a business unit, the AGUA No. 7. It is the municipality where the restructuring process shows the most progress since it was started to be implemented at the beginning of 2003, 6 months ago.

AGUA No. 7 is the largest section. Its coverage reaches the rural zone of the municipality, 2 corregimientos⁸ (Potrerito y Timba) and 4 veredas (el Guabal, el Triunfo, el Gaitán, San Isidro). The whole area served has household connection and the service is provided 24 hours a day.

This is the Agua where the enthusiasm generated by restructuring is most felt. The director says: *“There are less of us and we’re earning more. Nowadays, Acuavalle is contracting much less, we’re working with half the amount of staff, the costs are much less, and so the part of the tariffs which is directed towards investment is already being put into a special heading in the company’s total budget.”*

⁸ In Colombia’s administrative set-up, each Municipality is divided into *corregimientos* (best translated as bailiwicks), which are sub-divided again in *veredas* (best translated as neighbourhoods).

INGREDIENTS FOR SUCCESS

The factors which are considered key for different management model are analyzed below. However, this does not necessarily mean that each one carries a lot of weight in this case.

1. FINANCIAL AND MANAGEMENT AUTONOMY

Agua 7 has a director and 19 employees under his command. The director's management is guided by 8 commercial indicators (No. of claims, efficiency in claim service, service suspensions, service cuts, service reconnections, subscribers in arrears, reading productivity, readings criticized) and 8 technical indicators (average amount of water treated, plant capacity in liter per second, use index, number of plant operation hours, plant functioning time rate, service hours number, service continuity rate, leak control rate). Every two months, all of the Agua directors meet with the general manager to revise these indicators.



Acuavalle has responded to a centralized model in which local offices have very little autonomy. Restructuring aims for greater management decentralization, and Agua 7 is where the most progress has been made in this area. However, the management and financial processes of the greatest magnitude are still managed in the central office, as the director comments: *“We have partial autonomy, in relation to minor administrative and financial problems, or we can take decisions to find solutions for small maintenance issues, but we do not have general autonomy”*.

Part of the billing process is done in the section and other processes are projected for decentralization, little by little. They also interact directly with the users as payments are made, billing claims are received and payment agreements are negotiated for customers in arrears.

Agua 7 does not have its own bank account; resources are managed directly by Financial and Administration Management and Central Office Treasury in Cali. Staff, suppliers and tax payments are made there, while in Jamundí small contracts are carried out and the costs that can be managed by petty cash of \$830,000 (US\$ 292).

Section staff control. Currently, this office functions with 4 people in administration, (1 director, 1 admin-commercial assistant, 1 commercial assistant, 1 secretary) and 16 people in the technical area (1 district operative engineer, 12 operatives and 3 water treatment plant operators). There is a human resources department in the central office that traces the directives as regards staff management. The Agua 7 stands out because of the integration and good relationships between the employees, making it an example of what restructuring aims to achieve in this field.

All of the section staff are the responsibility of the director, but the operational staff coordinate their activities with the District Engineer. In the purification plant, which is at a different site from the office, the operatives must mark their time of arrival and leaving.

Stakeholders Support. From this year, the office has begun to hold meetings with users by sector. These meetings are set up by the Communal Action Group, and information on the system is given

in them. Generally the users are happy with the service, but they complain about the tariff price especially since the unemployment rate has risen, and therefore the town's income has decreased.

The president of the Sachamate Neighborhood Communal Action Group says: "...the most important thing about the Acuavalle office here in Jamundí is the service. When I come here as the Communal Action Group representative to ask for an adjustment, the engineer always receives me in his office ... the tariffs are high but the community is understanding that the service cost is justifiable for the good service provided, at least in my neighborhood there aren't many complaints, and as they're improving the service you pay it happily ..."

The Agua director and the district engineer have encouraged headmasters of local schools to visit the treatment systems so that they find out about them and become interested in supporting the involvement of students to the careful use of water campaigns that the company programs. They have also visited the Municipal council several times on their own initiative and that of others to answer worries that this organization has presented them with.

A year ago, the municipality created the company Acuajamundí S.A. E.S.P to serve the rural zone. The manager of this company was trained for 3 months in the commercial, administrative and operational area in the Acuavalle office in Florida (Valle). The company emerged a year ago because the previous Acuavalle administration chose not to serve two zones in the plain area (Paso de la Bolsa y Bocas del Palo) due to the fact that the socioeconomic study showed that the inhabitants of this area, because of their low income, could not even be classified in strata I. Acuajamundí has planned to begin service in this area (by buying water in bulk from Acuavalle, which is being negotiated) and then serve the municipality's mountainous zone. In the long term, they want to be able to serve Jamundí.

The relationship with the council is mainly with the planning office to find out about the municipality's expansion projects, and project the service possibilities that Acuavalle can offer. In addition, the Planning, Infrastructure and Traffic Divisions support them when they need to block roads to make repairs. Relationships with the Councils are usually dealt with by management, who are giving great importance to meetings with the Mayors. For the first time, this year, the Acuavalle manager has announced the delivery of dividends to the municipalities, but in Jamundí they are not happy with the amount they were given. As the Acuajamundí manager says: "*The manager wants to be fair in dividing up the profits, but Jamundí is the largest municipality that Acuavalle has in terms of collections, and we think it isn't fair that we should receive the same amount*". As regards the subsidies that the municipality should contribute for low strata, the Agua 7 director says: "*it's a figure that's only on paper*".

Political interference in the operator's management. Although the Mayors are shareholding partners in the company, they only intervene in its development through the Board of Directors, so therefore there is not interference in the local office's work.

In this Agua as in Acuavalle in general, if a change is made in the direction that Government has been taking until now, this would have dire consequences for the model. The director explains his fears as follows: "*If a politician turns up and takes all of the vacancies that have been left, this becomes a huge company, and at any given moment it could have 500 workers again, and so it could be a huge strength for politicians.*"

Tariff calculation. Stratification is carried out by the municipal planning department, the tariffs are calculated by Acuavalle following the methodology established by the Drinking Water and Basic Sanitation Regulation Committee, CRA, and to apply them, the authorization of the Commission is

needed. Although the tariffs should increase each time the CPI rises more than 3%, it has been almost eight months since Acuavalle has made an increase.

Billing. The company's network staff carry out meter readings and their registering; information that is sent to Cali, to the billing department. There, it is processed and a list of critical readings that contains the data of the previous month's reading and the current is produced, in order that in cases where there is a significant difference, the meter can be read again and sent to Cali so that they can go on to establish the cost with consumption and the user's strata. Agua No. 7 is the first Acuavalle section that can print the bills locally and make corrections to the bill when errors come up. Soon the company proposes to make an electronic reading register and contract an external mail company to deliver the bills.

User connection. This is carried out by section ground staff, following programming established with the Agua 7 direction. The user must make the request in the format needed by the company, enclose the strata certification and a photocopy of their identity card. They must also include documents that prove holding the property such as: the construction licence, real estate registration, building certificate, or land register identification. After receiving the documents, the company makes a home visit and determines service feasibility. The user or the company can do the digging for meter installation, paying for the costs in the latter case.

User Disconnection. In Agua 7 it is considered that cutting off the service is an extreme measure and therefore, before doing so they try to find a solution with the user, in a personalized manner, so that the user does not get disconnected, because a disconnected user is a loss in collections for the business.

The service is suspended after two months of not paying, and after six months, if a payment agreement cannot be reached, or the user shows that they are incapable of paying for the service, the company begins to dig from the main pipe, and cancels the water register.

System Investment and Means of Financing.

Acuavalle has not made big investments for 5 years. Currently, in the central office, there is a technical committee that receives the list of all of the Aguas' needs. This committee evaluates them and prioritizes where to make investments. The work is financed with tariff income. Before the economic crisis, investments were made mainly with national and departmental government, and on some occasions, municipal, resources. Maintenance work and/or micro work is dealt with by the local office.



Financial Viability

Acuavalle has a consolidated accounting system, without discrimination by municipality. Acuavalle S.A. ESP showed surpluses in the first six months of 2003, as well as in 2002, strengthening its assets. The utility margin in the current year is 10.7% showing an increase of 1.9% with respect to the previous year, positively affecting its financial situation. Liquidity is at 0.8, with the ability to observe its financial obligations at 80% without touching fixed assets.

Debts are at 30.9%, used for investments to improve the water systems that are its responsibility. On the other hand, the debt structure is 57% for 2003, which indicates that the company does not have a lack of financial resources to cover its commitments. The cost covering index of 1.33 shows that income covers operation, maintenance and administration costs.

ACUAVALLE's financial viability is good, supported by a significant utility margin, and consolidated economic stability.

Financial Indicators	First six months, year 2003	Year 2002
Current Liquidity	0.8	1.3
Utility Margin	10.7%	8.8%
Debts	30.9%	28.2%
Debt Structure	57%	44%
Cost Covering	1.33	1.07

2. TRANSPARENCY AND RESPONSIBILITY

The Jamundí office considers that transparency is related to the existence of reasonable and fair tariffs, adjusted to the tariff model in force in the country, and to the socioeconomic needs of the population being served. The tendering and contracting procedures are carried out in accordance with the guidelines established by Law 80 of 1993.



The Agua 7 office, like the other offices, saves documents about treatment processes, cost and tariff models, and user numbers, amongst others, for public consultation. But the most important

aspect is that they have an open door policy to maintain permanent interaction with users, in order for complaints to be solved quickly, and with personalized attention to the claims.

Responsibilities. The responsibility of Agua No. 7 is related to efficient and timely service supply, dealing with damages immediately, and finding solutions and answers to petitions, complaints and appeals lodged by users. The director is dedicated to “*servicing clients better, as we overlooked them for decades*”. Therefore, he insists his duty is:

- Providing water and sewerage services with quality, continuity and efficiency.
- Observing the regulatory framework defined for the sector.
- Reporting reliable results to control entities on time.
- Executing service expansion plans with efficiency.

The Director considers that the management indicators which have been established “*help to measure us, and to plan the work to come and what is waiting for us in the future. Before we didn't have that vision, and nowadays we do*”.

Users have their responsibilities established in the Standard Conditions Contract that is signed with Acuavalle S.A. E.S.P.

The responsibilities of municipal government are:

- Ensuring efficient public services in the locality.
- Promoting user participation in public service control.
- Carrying out stratification of the municipality.
- Granting subsidies for lower income users; in the case of Jamundí, the municipality owes Acuavalle \$2,000 million pesos (US\$ 705,467) for this reason.

The centralist practice that has existed in Acuavalle still has a lot of weight, and so it has not been possible for the local government to become more decidedly involved in public service management. In Jamundí, the Legal Office is very active in user interest defense, and many claims are directed to this authority, sometimes with copy to the company.

Auditing and social control of the company. External auditing is carried out in the central office by the Public Service Superintendence, the Regulation Commission, and the Finance Office. Internal control is carried out by the Cali office in the sections, checking registrations, income, document observance. It currently discusses its report with the local office with the aim that the control become a learning opportunity.

The Municipal Control Member has a strong relationship with the office to present user complaints. But the policy of the Agua Director is that “...*As the users gain more belief in the company, because it resolves their problems, they will have to go less to their representatives ...*”

3. PROFESSIONAL SUPPORT

Currently, the Human Resources Management department and a temporary work agency are formulating the job profiles to be performed according to the company’s needs, and guides for staff evaluation. The selection process is contracted with an external company, which is considered positive by Agua 7, as before political influence had more weight than merit. The Agua director sends the requirements and an external enterprise selects the staff according to their capabilities.

Training for Agua 7 staff is programmed from the central office in Cali. Since the year 2000, the company has been making a strong investment in training. Agreements have been signed with the National Apprenticeship Service, and private companies and consultants, to train operative and administrative staff. Human relations courses have had a huge impact with employees, as they have allowed them not only to reflect on their own behavior in the company, but also in their family.

The operative staff has been able to participate in training it did not have before, and have obtained certification in the area in which they have worked for several years.

The Jamundí office has also made sure that operational staff and network operators have knowledge of the commercial processes, and that the office staff visit the water treatment plant and understand the processes that are developed there.

Before, there were groups specialized in valves, hydrants, leaks, etc, that were concentrated in the Buga workshop. These groups have been disbanded and now each section should be capable of

meeting its own needs. From the management indicator analysis that has shown strengths and weaknesses, the sections have begun to support each other mutually, making loans and temporary transfers of staff with more experience in particular fields.

4. LEGAL FRAMEWORK AND REGULATION

Small towns' situation is not reflected in terms of national laws that regulate the tariff structure, nor are poverty conditions that some zones of the country suffer. Given that Acuavalle principally manages strata I, II and III, the current tariff structure means that the ones who lose out are the users because of the high costs in the tariffs that the operator has to charge to meet technical and administrative efficiency needs. As Acuavalle is regional, it redistributes its income so that higher income municipalities support the poorer, and this is what has strengthened this regional model of public services.

The costs for a public services company to adjust to regulation demands as regards effectiveness and efficiency often tend to be high. Even more so when new processes have to be started to be implemented rationally, along with training staff and inserting more and better technology in the company. But beyond the economics, the real cost is human, as the staff must be more efficient in their work, undertaking processes which to a certain extent are new, complex and difficult for them to deal with.

Management of the water resource is carried out by the Valle del Cauca Regional Autonomous Corporation, CVC and Agua No. 7 pays \$2,648,709 (US\$934) every four months for the volume of water collected.

As regards the polluter-pay rates, in December 2002, Jamundí owed the CVC \$1,150 million pesos (US\$ 405,644) and made a payment of \$28,000,000 (US\$ 9,877) in March 2003.

5. COMPETITION

Acuavalle has the monopoly on service production in Jamundí, but not on supply as it sells water in bulk to La Fontana S.A. E.S.P., which provides the service to 790 users in the La Fontana urbanization. Currently, negotiations are being carried out with Acuajamundí E.S.P. to also sell it water in bulk. In addition, Acuavalle sells the bill preparing service to the Jamundí Cleaning Company.

Acuavalle does not have contracts with any municipality because these are partners in the company. Only in the case of a municipality deciding to leave the Acuavalle company would Acuavalle stop providing the service.

The market offers competitive conditions for buying replacements and inputs. Using economy of scale, they manage to buy inputs at competitive prices which favor the company and the users.

In Agua No. 7, as in the other sections, benchmark type quality standards have not been established, but a permanent process of emulation exists between the sections with relation to the commercial and technical indicators established this year.

6. DEMAND RESPONSIVENESS

Jamundí, like all of the Aguas, has household connection, but it is the only section that is selling water in bulk. The treatment plant is conventional and does not have waste water treatment. Jamundí is the first section where hydraulic modeling is being implemented to allow to operate the system more flexibly. Before beginning this program, to repair damage, the network staff had to leave the entire town without water, but now the network has been sectorized and water losses are being controlled better. In addition, as the District Engineer indicates, *“with the new model we’re going to be able to answer new service demands more quickly. We put the information in the system and check to see if we can give away that stream or if we have to get reinforcements to meet the demand asked of us. Before, only the Cali office could answer, and now we can do it from here”*.

Jamundí is one of the municipalities with highest population growth in the department. Its closeness to Cali has caused vertiginous growth in its urban area (Ciudad Alfaguara, Terranova housing project, etc.). Therefore, Agua 7 has had to adapt itself flexibly to this growth, and currently the system is a combination of the previous system constructed more than 30 years ago, and one which was constructed 10 years ago to meet the municipality’s water needs. The same has happened with the sewerage system.

Users can be part of the development and social control committees. In Jamundí, agreements have been reached with users who have had the service cut off for many years, so that they can pay their obligations according to their means, and enjoy the service again.

7. INCENTIVES FOR EXPANSION

The municipality of Jamundí has two sources: the rivers Jamundí and Jordán. The river Jamundí has a suitable flow even in summer, but has a higher degree of contamination because it crosses a mining sector. The water that the plant currently treats guarantees supply until the year 2006, and the storage system is sufficient until this same year. Agua 7 has projects to extend the purification plant, the storage tanks, and the networks, to be able to serve the demands of the population. The Terranova citadel will hand over in August the first 600 homes but it is a project that contemplates handing over 5,351 homes in five years. Therefore, the first investment in network expansion to serve this demand is \$200 million pesos (US\$ 70,546) but the water that feeds the system will have to be increased.

There is a legal framework that allows for recovering the investment costs through the tariff, but the magnitude of the work would lead to very high increases in the same, when Acuavalle has not even made the two CPI increases that the Regulatory Commission has authorized this year. The company has never asked for loans to make investments, these have always been financed with its own resources, and even in previous years with contributions from the partners (Government and Municipalities).

8. OTHER INGREDIENTS FOR SUCCESS

The director and the district engineer both recognize the following as other ingredients for success for the work that Agua 7 develops:

Management will to undertake the transformation, which has implied giving employees greater participation and motivation, transparency in information management, driving training as much of the operative staff as the administrative, and the greater autonomy being given to the sections.

Giving great importance to the human factor, it implies recognizing the contributions that workers have made to the company with their work, and renouncing additional salary.

9. EVALUATION OF INGREDIENTS FOR SUCCESS

Ingredient for success	Rating from zero to five (five is the highest rating)	Reasons
Financial and Management Autonomy	2	It shows low administrative and financial autonomy. In the sections, only operative and minor commercial decisions are taken.
Competition	2	Entry barriers exist as Acuavalle is the asset owner and possesses the infrastructure. This makes the entry of new operators difficult.
Demand responsiveness (including service to low income households)	4	It shows large coverage and immediate disposition to serve new services; there is no program to serve homes that cannot even be classified in strata I.
Incentives for expansion	4	It is a municipality that has great potential for urban development, and consequently there is a great incentive to expand the system for the short term.
Professional support	5	The section knows that it can resort to other sections and the central office to solve problems it cannot find a solution to directly. In addition, it has the support of management to resort to external support if it is necessary .
Regulation	3	The regulations need to take the situation of small towns into account and have a poverty focus.
Transparency and responsibility	4	They are working on applying transparency and meeting their responsibilities.
Other Ingredients for Success:		
Management will	5	The section gives great importance to the support received from superiors for management improvement.
Valuing talent	5	Great enthusiasm can be perceived between the section workers; they are determined to do their very best.