Professionalized Rural Service Areas: A Strategy for Improving Rural Water Supplies

Volume1 – Strategy Overview

February 2013

Acknowledgements

This report has been produced through collaboration between the Water and Sanitation Program (WSP) and the African Development Bank (AfDB). It has been made possible thanks to generous support from Multi Donor Water Partnership Program of the African Development Bank with funds from the Governments of Denmark, Canada and the Netherlands.

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The Professionalized Rural Service Areas (PRSA) approaches presented in this report build on the conceptualization of what was previously referred to as the FRUGAL model (Forming Rural Utility Groups and Leases) for improved service provision and management of rural water supply.

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1 Introduction

Standard approaches to rural water supply and sanitation have had some success in increasing access, but have often failed to provide sustainable coverage. Over the past decade, new approaches to rural water supply have begun to emerge in various parts of the world, largely in response to changing rural household conditions and attitudes.

Two key elements often characterize these approaches :

- Aggregation (or grouping) of service areas;
- An entrepreneurial approach characterized by participation of the domestic private sector, through medium to long-term service contracts that combine operation, maintenance and new construction activities under a single contract.

These elements have been successful in attracting financing, professionalizing service management, augmenting customer choice, and increasing cost recovery. Although numerous experiences around the world incorporate one or several of these elements, this document suggests that combining all these elements together could deliver maximum benefits for the rural population.

In this document, strategies that adopt some or all of these elements are collectively referred to as the Professionalized Rural Service Areas (PRSA) strategy.

The document is structured as follows:

- ***Volume 1*** sets out the strategy, providing policy-makers and potential lenders or investors with examples of proof-of-concept while outlining the main characteristics underlying PRSA (including aggregation and contracting domestic private operators).

- A companion volume (***Volume 2***) provides guidance on testing the applicability of this proposed strategy under a variety of national contexts and local conditions.

This document was initially conceived for potential application in Sub-Saharan Africa, but the information provided could be applied in a variety of regional contexts.

Although this report acknowledges that sanitation needs to be provided alongside water supply, it does not make specific recommendations at this time as to how such services could be more effectively delivered under a PRSA strategy.

2 The context

2.1 Meeting rural water and sanitation goals

The Millennium Development Goals (MDGs) envision that the percentage of persons without access to improved water or sanitation services should be reduced by one half over the period 1990 to 2015. The Joint Monitoring Programme's statistics (WHO, UNICEF 2010) reveal that as of 2008 urban access to improved water and sanitation stood at 96% and 76%, respectively, which practically surpasses the overall MDG targets of 89% and 77%. However, the percentage of rural people with access to water supply and sanitation stood at 78% and 45%, respectively, both well short of the worldwide MDG targets. As of 2008, 85% of the world's unserved for water supply and 70% of the unserved for sanitation were rural people[1], or put more simply, nearly 100% of the remaining MDG target can be found among the world's rural population.

2.2 The limits of current approaches to rural water services

There are many reasons as to why rural areas are underserved, and these have been explored and enumerated elsewhere. In the case of water supply and sanitation, among the primary factors resulting in unsatisfactory outcomes for rural areas is reliance on a service delivery model that depends upon communities for sustainability, makes little or no provision for long-term cost recovery, and keeps service levels low. Insufficient investment in rural service provision is usually linked to the perceived weaknesses of the service delivery model itself[2]. The alternative strategy proposed in this document reflects an attempt to respond to this set of critical issues.

The current approach to rural water supply (and to a lesser extent to sanitation as well), involves project funding for small, low-maintenance systems operated under community management. This approach has resulted in a functionality rate of approximately 70%, a typical capital cost recovery rate of less than 10% for water supply, and a low level of service for which many rural users are unwilling to pay[3]. This current rural "package" emerged after years of frustrated effort at providing sustainable rural water supplies, having evolved from a purely technical strategy to a largely social science strategy, the latter of

[1] The long-standing urban bias for investments and outcomes is well-documented. Lipton's (1977) seminal work on the topic has since been reinforced by dozens of studies showing lower investment levels and outcomes for rural inhabitants along every measure of health and human services, ranging from literacy and poverty rates to transport and communications access, including, as described above, basic water and sanitation services.

[2] The success of the urban service provision model can also be called into question. Non-revenue water in cities is commonly 40% or more, operational costs are largely unmet, and the burgeoning business for small-scale independent providers suggests that public and private utilities are deficient along multiple measures of customer satisfaction.

[3] It remains challenging to estimate even the most basic of rural service delivery parameters since these are almost universally not collected or even as much as defined, in contrast to the widely-accepted metrics and benchmarks developed for urban utilities. RWSN's "Sustainable Water Supplies" flagship report estimates non-functioning water points in Africa to be nearly one in three http://www.rwsn.ch/prarticle.2005-10-25.9856177177/prarticle.2005-10-26.9228452953/prarticle.2009-03-09.1365462467. Regarding capital cost recovery see Loughborough University's WELL Resource Center estimate. http://www.lboro.ac.uk/well/ resources/fact-sheets/fact-sheets-htm/Scaling%20up.htm.

which generally consists of the application of the Demand-Responsive Approach (DRA)[4], and the installation of simple technologies such as handpumps that could be repaired at the community level or gravity-fed systems that eliminate energy costs.

At the same time, fundamental changes in rural areas are taking place (see column to the right) – changes that may call into question some elements of the current rural package. In a growing number of rural areas, populations tend to be more mobile, more diversified in their livelihood strategies, more integrated into the cash economy, better informed about service options, and most importantly, actively pursuing improved services even if that implies making higher payments[5].

It therefore appears possible to aim for improved water services, with higher functionality and cost recovery rates (acknowledging the fact that full-cost recovery, including of capital costs, is not achievable in the near future in rural areas). To achieve these improved outcomes, a new strategy to providing rural water services is called for.

Why a new approach to rural water supply makes sense now

Changes in rural areas, including growing access to telecommunications, improved transport, increased incomes including remittances, and more diversified income sources, leading in many countries to increasing demand for higher service levels.

Improved domestic private sector skills, due to increasing decentralized tenders allowing local artisans and firms greater familiarity with technologies and approaches, and longer-term experience with rural water projects. Commercial network expansion results in growing efficiencies.

Decentralization reforms continue, and local governments are keen to identify more efficient and effective ways of financing water supply infrastructure while keeping existing works operational, in line with their ever-expanding responsibilities for service delivery. LGs are increasingly looking to the domestic private sector for partnering. skills of LG staff are

2.3 Looking for alternative strategies

The subsector has attempted to respond in a variety of ways to the challenge of making rural service provision more attractive for investment from governments, donors, lenders, and households, and alternative approaches are being developed in all regions[6]. What these alternatives usually have in common is greater reliance on users to pay for the level of service they desire and reliance on the domestic private sector to both improve service levels and long-term operations.

Alternative financing arrangements to support the development of the private sector in remote rural areas may include the use of Output-Based Aid (OBA) (as in Paraguay), microfinance (as in Kenya) or

[4] DRA is based upon informed choice and adequate cost recovery, however, there has historically existed a significant gulf between DRA in theory and in practice.

[5] Rural areas have been viewed for years by government officials, donors, and entrepreneurs as an investment sinkhole that requires continuous inputs while producing few returns. Research, for example by Econ One Research, Inc. (2003), has demonstrated that rural households are keen consumers that are not only increasingly willing to pay for improved services, but are better customers than urban residents by generally paying their bills on time and engaging in less theft of service.

[6] Kleemeier and Narkevic (2010) provide a useful review of these alternatives, including an extensive bibliography for further analysis. Case studies documenting experiences with professional rural water services were commissioned by WSP and are available on demand. They review experiences in Burkina Faso, Cambodia, Niger, Paraguay, Rwanda and Senegal.

standard financing instruments such as bank loans, especially for small towns.[7] These initiatives represent a fundamentally new paradigm, and as a group can perhaps best be described as "entrepreneurial approaches".

As these entrepreneurial approaches become more commonly employed, a change in mindsets is required at the level of public policy-makers and donors. Rural services would need to be designed under a longer investment horizon, as opposed to rural infrastructure which is commonly designed for periods of fewer than 20 years, or even less than ten[8].

Similarly, additional management options need to be developed as the limits of community management are reached. Just as urban and small town water services have been professionalized over time, so too must rural service provision be managed professionally, adapted to rural conditions and standards. The strategy proposed in this document draws successes from around the world and recommends packaging these approaches in a more coordinated manner so as to make rural service provision more sustainable not only financially, but technically, environmentally, and institutionally.

Where the PRSA strategy is introduced it is important to also hold community-managed water systems to the same set of standards and targets as the private sector, including water quality, service continuity, and reporting. This is meant not simply to "level the playing field", but to ensure that service improvements and accountability are applied to all regardless of the post-construction management regimen in place.

3 Overview of the Professionalized Rural Service Area (PRSA) strategy

3.1 Objectives

The objectives of the proposed PRSA approach to delivering water services in rural areas are multiple and seek to address the various weaknesses identified with many existing rural service provision models. They include:

- Attracting additional funding to RWSS;
- Improving service sustainability;
- Providing greater customer choice;
- Increasing capital cost recovery;
- Accelerating the rate of increase of access;
- Creating economies of scale;
- Professionalizing rural service delivery;
- Improving service quality primarily through the introduction of accountability.

[7] Mehta, Meera and Kameel Virjee (2007). Trémolet and Scatasta (2009).

[8] Longer-term investments could be made in stages, for example, a borehole can be drilled from the outset with enough yield to provide a certain percentage of house connections over a twenty-year design period, though the pump and modular storage would be sized for the expected demand over the initial seven to ten-year period.

Countries possess a unique blend of legal systems, rural conditions, human development levels, climates and hydrogeologies, policy frameworks and goals, and histories of rural development. As a result, it is not possible to put forward a single approach (i.e. "a magic bullet") that would solve all problems at once. Instead, this document presents the key elements of what a more professionalized strategy might include, based upon lessons learned from around the world, and suggests ways of implementing these elements in a more coordinated and structured manner that addresses the weaknesses in the current rural water supply approach used under any given set of circumstances.

3.2 Key elements of a PRSA strategy

The two key elements of the proposed strategy are the following:

- Aggregation of individual water systems and water points into a single service area;
- An entrepreneurial approach characterized by participation of the domestic private sector through medium to long-term service contracts that combine operation, maintenance and new construction activities under a single contract.

The PRSA strategy suggests that, where possible, these elements be introduced in a coordinated manner (if not simultaneously) for the reasons set out below:

- ***Aggregation*** of individual water systems and water points into a single service area can allow economies of scale (where systems are shared) or scope (by spreading overhead costs over a larger customer base). It can also help create a broader financial basis to attract external finance (thereby reducing transaction costs and smoothing out risks) and introduce cross-subsidies where necessary. In some cases, it can therefore be a pre-condition to attract private sector providers with sufficient experience and the ability to bring in or mobilize financing;

- ***Domestic private sector involvement*** can allow management skills and technical expertise to be attracted into the sector so as to improve service sustainability, sourcing spare parts and other inputs in a more efficient manner, focusing on what customers need and want, strengthening financial management so as to be able to attract external funding (from either public or private sources). Medium to long-term service contracts for both construction activities and operation and maintenance tasks under a single contract would allow improving the sustainability of the services whilst maintaining emphasis on adequate operations and maintenance beyond the initial construction phase and increasing cost-recovery.

These elements are further described in Table 1.

Table 1: Key elements of PRSA strategy: expected results and proof-of-concept experiences

Element	*Element Description*	Expected Results	Proof-of-Concept Experiences
Aggregation of service area	Unified service areas are created, either within one political unit or across political units, that might include urban, small town, and disperse rural areas, but should always include disperse and concentrated rural areas within the delineated service zone.	• Lower investment costs per vol. of water • Lower O&M costs per volume of water • Attracts local domestic private sector • Likelihood of service bundling increased • Cross-subsidies possible	• Successful service area aggregation among small town water supply systems in many countries in both the developed and developing world • Successful grouped delegated management contracts in Niger, Burkina Faso.
Domestic private sector involvement	Medium to long-term lease, Design-Build-Operate (DBO) or Design-Build-Lease (DBL), and/or management contracts, signed and supervised among the domestic private sector operator, the local government, and participating communities; Incentive for private sector to increase service levels, expand service areas, and thereby increase revenues.	• Professional management introduced • Increased competition at the outset • Higher service levels introduced • Local Government relinquishes some direct implementation activity	• Successful large-scale experiences in domestic private sector management of small town water systems, both aggregated and non-aggregated (for example, Niger, Mauritania and Uganda in Africa); • Successful large-scale application of domestic private sector contracts in aggregated and non-aggregated gravity-fed piped systems in rural villages (Rwanda), or for bulk water supply (Ecuador) • Successful small-scale experiences of domestic private sector operators using Output-Based Aid for small town water (Paraguay) • Successful small-scale experiences of domestic private sector owner-operators for small town water supplies (Cambodia)
Longer length of contracts	Minimum of 3-5 years; new service levels and management options defined and available to users under clearly specified contractual obligations; private management can only be undertaken for functioning infrastructure; medium to long-term lease, DBO/DBL, and/or management contract periods specify longer service design periods, longer capital cost recovery periods, wider flexibility to extend service areas and upgrade facilities in order to increase service levels over time; contracts between government and the domestic private sector contain guaranteed minimum public funding where new construction or rehabilitation is undertaken.	• Clear oversight mechanisms put in place • Accountability for long-term service quality targets is introduced along with increased monitoring • Increased cost recovery (capital and recurrent) • Higher service levels introduced • Payments and fees extended over time • Small income stream produced for LG • Long-term planning facilitated	• Successful experiences with the upgrading of village water supplies from single standpipes to networked distribution systems which include house connections. Operations can be handled either by community water committees or by private sector operators as decided by each user association (Senegal) • Successful large-scale application of domestic private sector contracts in aggregated and non-aggregated gravity-fed piped systems in rural villages that include improving user service levels from standpipes to house connections (Rwanda)
Operation and maintenance, plus new construction under single contract	Builders that are responsible for long-term maintenance are more likely to build to standard in order to reduce maintenance and repair costs, though more robust and reliable technologies will be preferred. May require minimum public investment guarantees for new construction and rehabilitation of existing services; initial capital costs likely to increase.	• Attracts interest from domestic private sector • Construction quality improves because builder must also operate systems • Improved operations and maintenance, including more reliable technologies • Increased potential for profits	• Successful small-scale experiences of domestic private sector operators using Output-Based Aid for small town water supplies (Paraguay) • Successful small-scale experiences of domestic private sector owner-operators in small town water supply (Cambodia) • Successful experiences with the upgrading of village water supplies from single standpipes to networked distribution systems which include house connections (Senegal)
Overall		**Put together, these elements are expected to attract new financing for rural water supply and sanitation, increase service quality and sustainability, and accelerate the rate of increase of access**	• **No known experience fully incorporates all these elements. However, domestic private sector operation of village water systems has seen contracts extended from an initial period of one year to a more sensible three years in Rwanda, and up to seven years in Burkina Faso.**

As described in Table 1, the first key component of PRSA is the ***aggregation of services into an efficiently-sized service area***. What urban areas attain through population density, rural areas can to a degree attain through aggregating areas. Research has shown that there is a point of maximum efficiency for utilities, where marginal unit costs are minimized. Research also suggests that there is a size over which diseconomies of scale appear. A population range for maximum efficiency can be imputed for the urban context in developing countries as roughly between 50,000 and 250,000 persons per service area[9]. Contrast this with the average village size of fewer than several thousand, or even fewer than several hundred. In fact, as professional management expands from urban to rural areas (as witnessed by the successful aggregation around the world of small towns into single management units), it is clear that aggregation has begun to spread to less dense areas. The role of aggregation should not be over-emphasized, however, since it is also clear that rural areas, with their low population densities, lower income levels, and miniscule number of large-scale consumers, present a significant challenge to efficient service delivery. The topic of aggregation is explored more fully in section 4.3.

The second essential components involve the ***participation of the domestic private sector***. The domestic private sector has become the new service provider of choice for governments wishing to reduce their direct implementation role in water supplies and other services. The domestic private sector, under appropriate conditions, is successfully managing city and town systems in many countries around the world, both developed and developing. ***Longer term contracts*** could result in increased private sector participation in tenders, expanded service options being made available to customers, increased periods over which users can repay capital costs (with smaller up-front charges), improved long-term planning for both the government and the private sector, and reduced transactional costs. Combining ***operation and maintenance duties for functioning water supplies as well as responsibilities for new construction within the contract area*** would also be critical in order to ensure long-term sustainability of the services provided. O&M costs would be recovered from the users, and financing for new construction would primarily be provided by government though subsidies, though some private funding may be available in certain countries. In terms of contract types, Design-Build-Operate (DBO) and Design-Build-Lease (DBL) schemes such as those utilized by urban utilities may be an option. The use of Output-Based Aid, private credit, or other forms of partial government subsidies may be involved.

The PRSA strategy would represent a significant departure from existing models for rural water supplies. There are, of course, inherent risks and challenges to its implementation, and these are described and addressed in section 5, though it should always be remembered that there are certain key conditions under which the PRSA strategy is not expected to function. For example, where the government does not support public-private partnerships of any kind, or where local governments are especially small, or where government is averse to increasing funding to rural populations, this approach should not be considered unless accompanied by a major reform effort.

[9] This holds true for urban utilities which have been extensively studied, as described by Nauges and van den Berg (2007), but especially so for smaller-sized utilities, as reported by Tynan and Kingdom (2005).

PRSA should only be attempted or expanded in countries where the minimum conditions for its application are already present. Volume 2 describes in more detail the initial conditions under which a PRSA arrangement is best suited.

Potential variations. There are many dimensions of PRSA on which initial decisions must be made. For example: whether or not service areas can cross political/administrative boundaries; whether to bundle two or more services (which could include sanitation provision); the maximum and minimum population sizes within the service area; choosing whether or not to include investment funding from the public sector (as in, for example, a DBL or DBO option); the length of the initial contract; measures of success and performance targets; the degree of domestic private sector participation; degree of linkage between small towns and urban areas to disperse rural areas in order to facilitate cross-subsidization from one area to the next; the inclusion of different types of service level (such as piped vs. non-piped) and others.

A wide variety of PRSA-like approaches is already being successfully implemented around the world, though no two countries are approaching it in the same way (see Box below). Few countries have introduced all key elements of the proposed approach at once in a coordinated manner. Some countries have adopted these principles in recent reforms and policy documents but have not yet reached full-scale implementation. For example, in Burkina Faso, the 2001 water sector law includes the possibility of delegating services but the private sector has so far been limited to occasional interventions. In Senegal, although the reform initiated in 1998 requires that the Water Point Associations (ASUFOR) hire a private operator to manage the borehole, only a few associations have gone ahead with signing such contracts and the existing contracts transfer only limited responsibilities (and associated risks) to private operators. The Senegalese government is planning to let a number of lease contracts in rural areas soon so as to experiment with contracts that give a higher degree of freedom to private operators.

In a number of countries, however, evidence is available to show that these types of approaches can lead to a rapid increase in the growth of rural services together with improved sustainability over time (see Box 1 below).

Box 1 - Examples of PRSA-like arrangements around the world

Rwanda: In 2001, the Government of Rwanda included the participation of rural private operators as a key component of its sector policy. Whereas there were no private operators in 2002, they were managing a fifth of rural systems in 2009 (178 in total), and 7% were managed by semi-public institutions (such as hospitals, churches, etc). The contracts with private operator are "management contracts", whereby the operator is responsible for operations and maintenance of the existing system but not for investment. The average length of contracts is 2 to 5 years, with each operator managing between 2 and 4 systems.

South Africa: in the late 1990s, DWAF (the Water ministry in South Africa) relied on the private sector to rapidly increase coverage and support the transfer of responsibility for water facilities to local governments. These contracts, referred to as BoTT (Build, Operate, Train, Transfer), included the construction of new infrastructure, training of local governments and communities on how to manage it and transferring the facilities to the local governments. Provincial governments let those contracts covering a multi-year period and several rural water systems. Investment finance came from the national government. The operators were consortia including construction companies, operators and NGOs specializing in the delivery of water and sanitation services to the poor, such as the Mvula Trust. BoTT proved successful as a means to allow central government to quickly build and transfer water infrastructure to local governments that were not in a position to do it themselves. The success of the model was highly dependent on the availability of subsidy funding, however, which means that replicating it elsewhere may be difficult.

Paraguay: There are 500 aguateros (private operators) in urban areas in Paraguay. They are 100% self-financed and market-oriented (they design and build the water system based on their assessment of the customer demand). Prior to a World Bank-led project featuring OBA financing, none of these aguateros had provided services in purely rural areas. They considered the water market in rural area as risky and unprofitable. The OBA subsidy introduced in 2004 modified the business parameters. It was attractive and many companies competed for the contracts. The pilot project demonstrated that private operators can provide a modern service in rural areas, just as they do in urban areas. In this case, local private entrepreneurs were not only willing to provide services but to invest in small towns based on the incentive structure designed and the subsidy provided.

Sources: Hydroconseil (2010d); Hydroconseil (2010e); Kleemeier and Narkevic (2010).

Service functions can also conform to a PRSA-type arrangement. Virtually any of the functions of rural water supply can be aggregated: operations and maintenance, management, or bulk water supply, for example. Equally all these services can be combined with construction, as with DBO, DBL, or BOTT schemes.

It should also be noted that a PRSA-type arrangement can evolve rapidly from one year to the next as policy makers, local government, the domestic private sector, and customers become more familiar with the approach. In ***Rwanda***, for example, within three years of initial testing with domestic private sector operations and maintenance of individual gravity-fed water systems, entrepreneurs branched out to provide O&M services for multiple gravity systems, as well as facilitating the installation of ever-increasing numbers of house connections without the need for outside funding.

4 Key considerations for implementing a PRSA strategy

Prior to implementing a PRSA strategy, it is essential to understand which key stakeholders are currently involved in service delivery, policy-making and regulation and to assess which services need to be delivered, as discussed in the following sections:

- Key stakeholders and their roles (Section 4.1);
- Services to be provided under a PRSA arrangement (Section 4.2);

This section 4 then briefly discusses the main parameters of choice that need to be considered for implementing the PRSA strategy, including:

- The potential for, and forms of, functional aggregation (Section 4.3);
- Appropriate contractual forms for hiring a private operator (Section 4.4);
- Financing arrangements (Section 4.5); and,
- Defining a monitoring framework (Section 4.6).

The objective of this section is to present some of the options available along each of these dimensions. Additional guidance on making these choices can be found in Volume 2.

4.1 Key stakeholders and their roles

Prior to considering the implementation of a PRSA model, it is first necessary to identify the key stakeholders and understand their respective roles and how they interact at the national, regional, and local levels.

4.1.1 Who are the stakeholders?

Developing a stakeholder typology is facilitated by the relative convergence of national sector policies that has been observed amongst countries in recent years. Not all the stakeholders listed below are always present:

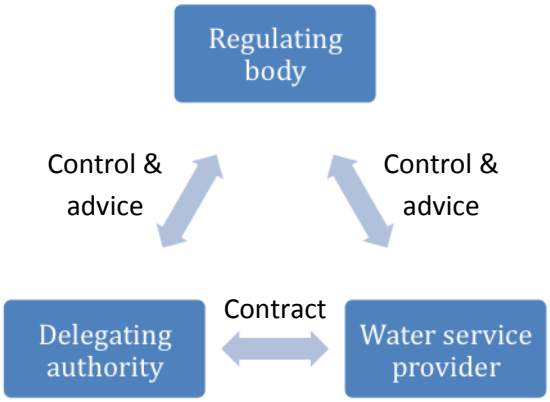
- Local governments (LGs), including sub-districts, districts, municipalities, provinces, states, regions, etc.
- Water Service Boards (WSBs)
- Ministerial Technical Departments (MDs), with or without local representation, including Health, Education, Public Works, Water Resources, Social Welfare, Agriculture, Rural Development, etc.
- Water Service Providers (WSPs), public and private groups or individuals that manage services
- Private Operators (POs), including local private sector technicians and artisans
- Non-governmental Organizations (NGOs) and Community-Based Organizations (CBOs)
- Sector Regulatory Agency (SRA)
- Financing Agencies (FAs), including banks, credit programs, regional development programs, etc.
- Others exercising complementary roles in the sector including local public health volunteers, school teachers and administrators, community promoters and activists, prominent citizens, etc.

4.1.2 How do the stakeholders interact?

The stakeholders can be grouped into three primary functional areas: (i) asset holding and water service delegating authorities; (ii) water service providers; and (iii) regulators.

Asset holders and delegating authorities	Water service providers	Water service regulators
•Local government •Water service boards •Central government	•Private operators •Water user associations •Public/private utilities	•Ministerial departments •Regulating agency •Local governments

In most countries, LGs and WSBs hold the asset ownership and delegating authority. Either the LG exerts this function directly (West African countries) or it is delegated by LGs to a WSB (East African countries). A performance contract may be established between the WSB and the central government through the ministry in charge of rural water supply. In a minority of countries, asset ownership and delegating authority are still retained by the central government (Senegal), and communities may occasionally exercise *de facto* infrastructure ownership.



Water services providers operate under a delegated management contract with the asset owner, i.e. in most cases the LGs or the WSBs. Most of the existing contracts are similar to a lease contract with shared financial management between the WSP and the delegating authority. Under this arrangement the WSP has the full responsibility of recovering the tariffs from water customers and of taking over all direct operating costs (energy, staff, maintenance, and repairs); the WSP must also pay the asset owner a fee (generally per m^3 abstracted) covering the main equipment replacement costs and system expansion investments. When a written delegated management contract is formally established, the WSP is most often a private operator. Community management may or may not operate under any legal instruments.

Regulatory agencies characteristically operate in urban areas only. In rural areas regulatory functions are commonly assigned to Ministerial Technical Departments through their regional offices or LGs, either formally or informally.

A more extensive set of functional areas is described in Table 2. It bears noting that local governments are being asked to assume significant leadership and technical roles under a PRSA-type arrangement. The implementation guidelines in Volume 2 of this series goes into greater depth describing the required pre-conditions for the successful application of PRSA, including the importance of political and

administrative support from and for local government. Similarly, a vibrant domestic private sector, encouraged by favorable government policies, is critical to the success of this strategy.

Table 2: Extensive set of functions for sustainable rural water services

Function	Main tasks	Potential allocation
Asset-holding	• Own existing assets and manage their development • Service the debt and identify financing (if applicable) • Plan and carry out long-term investments • Let contracts for investment-related services	• LG • Asset-holding company at higher level of government
Local level policy formulation	• Set coverage and service quality targets in accordance with village development objectives and national standards • Identify households requiring subsidies	• LG
Operations	• Service provision • Routine maintenance • Improvement of operational efficiency • Expansion of production or distribution • Provision of supplies and spare parts	• Community group • Local utility • Private operator • Specialist goods and service providers
Corporate oversight	• Provision of strategic direction for the utility / service provider • Monitoring of management's activities (approve budgets and reports) • Approve business plans and budgets • Propose tariffs	• Water Services Board or equivalent (public or private) under LG
Regulation	• Approve tariffs for water services • Monitor service quality and resolve customer complaints • Monitor environmental impact • Maintain competitive conditions and regulate other supply modes, such as small scale operators	• LG • Contract monitoring unit at MD or WSB (with support from both above and below, from the national regulator and water user associations or CBOs, respectively)
Capacity Building	• Promotion of appropriate use • Technical and administrative support • Training • Institutional development	• LG • MDs • Private operators • NGOs / CBOs / volunteers • Specialist goods and service providers • Training and institutional development centers

4.2 Services to be provided under a PRSA arrangement

The scope of water supply services provided to the rural population is not expected to change fundamentally (though it may) with the PRSA strategy, but rather to decisively improve the quality and availability of these services.

4.2.1 Type of service

Rural populations access improved water from two main types of water points: (i) piped water systems (PWS), and (ii) point sources. The water point typology shown below lists the service types accepted by

the Joint Monitoring Programme[10] (JMP) as constituting access to improved water, and which are acceptable for reaching the Millennium Development Goal (MDG) targets.

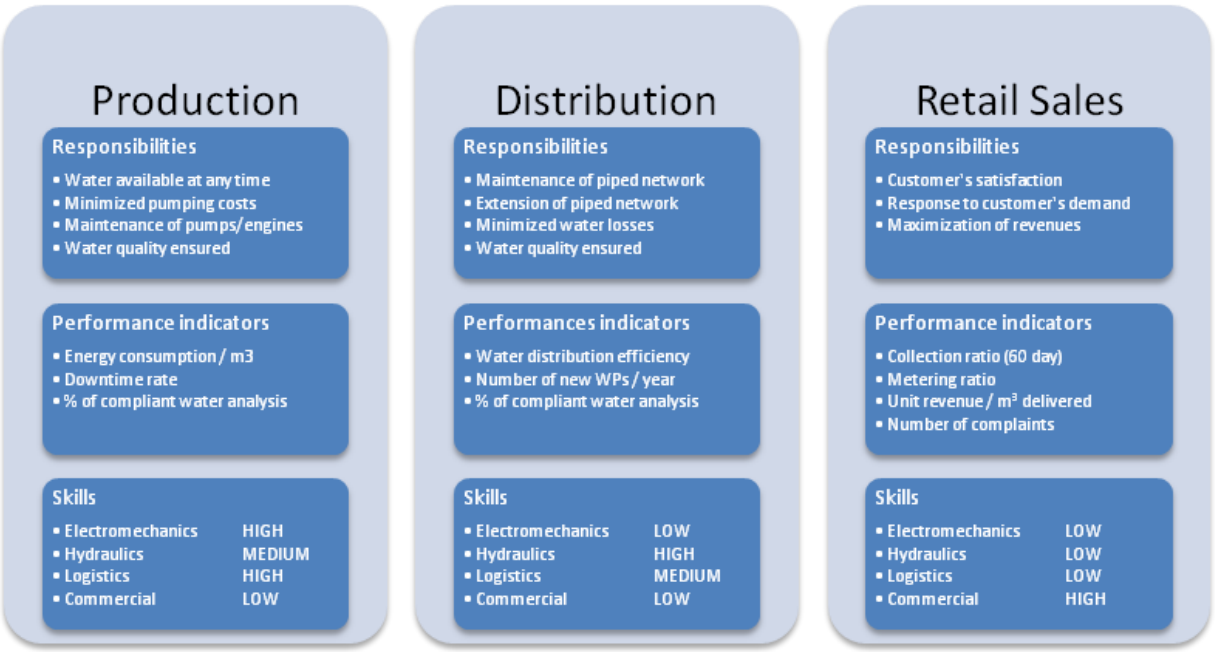
Access to water from piped water systems	Access to water from "Point sources"
• Water kiosk (communal tap) • Yard connection • House connection	• Borehole or tubewell • Protected dug well • Protected spring • Most rainwater collection

Each type and sub-type of service needs to be analyzed in terms of its technical characteristics, investment requirements, maintenance characteristics, revenue streams, recurrent costs, and other relevant features that make it more or less appropriate for inclusion within a PRSA-type arrangement. Volume 2 looks more closely at the relationship between type of access and PRSA design. Several key questions need to be closely analyzed, regardless of the type of service: (1) is the system (or would it be) fully functional throughout the year, and if not can it be made functional economically?; (2) is the system (or will it be) depended upon almost exclusively by households for their domestic uses, or are there multiple alternative sources available?; and (3) does the system (or will it) fully meet the needs of the user community, and if so are they willing and able to pay to keep it operable?

Functional responsibilities

The technical and managerial organization and tasks involved in the water service from Piped Water Systems (PWS) can be split into 3 main operational functions: water production, water distribution, and retail water sales. A specific set of responsibilities, performances indicators, and required skills can be attached to each function, as shown below. In the case of less complex technologies such as springs with gravity systems, or wells and boreholes with handpumps or other lifting devices, the same set of functional responsibilities applies, though the specific responsibilities, performance indicators, and skill sets may vary. These issues are further detailed in Volume 2.

[10] The Joint Monitoring Programme is the United Nations' official mechanism for monitoring the water and sanitation MDG targets, managed jointly by WHO and UNICEF.



4.2.2 Complementary services

Providing water services on a sustainable basis requires the existence of linked activities/services in various domains such as financing, audit/certification, capacity building, and hygiene promotion.

Financial services are required by WSPs for short-term (securing cash) or mid to long-term (savings for future replacements) transactions, as well as for obtaining loans in case of system extension, cash-flow financing, etc.

Capacity building & training services may be required from WSPs in order to improve their skills in either the administrative, commercial, or technical domains. Demands mostly cover invoicing and accounting tools as well as daily operation and maintenance procedures. Water users associations acting as WSPs, individual entrepreneurs, and firms facing various management issues frequently express these types of demands.

Audit and certification services are becoming increasingly important with the progressive implementation of delegated contracts. Offering such services on multiple sites spread over vast geographical areas at affordable costs in comparison with mean water sales revenues represents a major challenge.

4.3 Potential for and forms of aggregation

4.3.1 Overview: what is aggregation?

The rationale. A village or town that has insufficient capacities to deliver and improve water services on its own may benefit from joining with its neighbors for service delivery[11]. By pooling resources together and increasing their revenue base, the villages can collectively reach a more efficient scale of operation and be able to hire skilled technical and managerial staff.

The main benefit of aggregation is that it gives opportunities for improved efficiency through economies of scale and scope. Economies of scale may arise from the ability to reduce production costs as the volumes produced increase: they would be generated typically in the event of sharing a given infrastructure which can therefore operate at a larger scale. Economies of scope, on the other hand, would emerge not from sharing the infrastructure but rather from the sharing of costs over a broader customer based and corresponding efficiencies (in terms of administrative and technical support costs, procurement efficiencies, or shared costs for accessing financing). As a result, aggregation can also allow carrying out certain functions (such as procurement of spare parts or marketing /communication campaigns) more cheaply and effectively.[12]

Aggregation may be carried out as a first step to reach economies of scale so as to be able to contract a private operator to operate the services, which is one of the key concepts underlying the PRSA strategy. Potential benefits and constraints of aggregating are detailed in Table 4.

Table 4: Potential benefits and constraints of an aggregation process

Potential Drivers and Associated Benefits	Potential Constraints and Disadvantages
• Facilitates access to water resources in water-scarce areas • Allows economies of scale in designing works for neighboring towns or villages • Allows economies of scale in procurement and support functions • Permits economies of scope in sharing overhead costs • Facilitates access to both grants and credits • Allows cost sharing between high and low cost service areas • Increased cooperation between local governments can lead to cooperation for other public services • Fosters a more integrated approach to water resource management	• May result in a loss of control over water resources • Introduces distance with end-users and makes it more difficult to tailor services to meet their needs • May result in a loss of democratic accountability • Requires political will to aggregate at the local level • May limit the potential for direct competition, or comparative competition, between service providers • Introduces risk of resistance to cost sharing from those that "lose out" • Transaction costs are potentially high

Source: ERM et.al. (2005)

[11] Multi-village systems have been designed and built for decades throughout the world, though community groups have always been tapped to manage these complex systems, with varying degrees of success.

[12] The size of these economies varies from one context to another and few studies have been able to estimate them decisively in a rural context. A key objective of the testing (for which Volume 2 provides practical guidance tools) would be to measure potential and actual savings from aggregation in a series of concrete cases.

Potential advantages of aggregation. Aggregation may be advantageous in a variety of circumstances, although there may be associated obstacles in each case. For example, it may make sense for several villages or towns to share access to a water resource and build a single well or water storage facility instead of each of them building separate facilities, which would be more expensive to build and to operate. Administrative boundaries dividing towns and villages seldom reflect natural boundaries, and the most economical way to access water may be to tap a lower cost source available on the territory of a neighbor rather than to develop a more expensive source within one's own jurisdiction. This principle has driven the development of rural water infrastructure in Senegal, for example (see Box 2).

Box 2 - Multi-village systems in Senegal

Until recently, the Government of Senegal has been the main actor in terms of developing and maintaining rural water infrastructure. Early on in its planning, the Government introduced the notion of grouping several villages around a single water storage facility providing access via a reticulated system to neighboring villages, which can be supplied via standpipes or house connections in some cases. This was implemented for relatively large villages (1,500 to 2,000 inhabitants) surrounded by smaller satellite villages (200 to 700 inhabitants) with which they have strong socio-economic and cultural linkages. There are about 5 villages served by each borehole in existing rural water networks in Senegal.
Source: Hydroconseil (2010f).

Aggregation may also be particularly advantageous for accessing financing for new investments, especially for projects like reservoirs and treatment works which may be shared between villages and towns. The transfer of oversight responsibilities to a higher level can bring other benefits. For example, it would reduce the costs of performance monitoring while improving its quality. Contracts can be better managed and environmental standards including control of abstraction can be better controlled.

Professionalized management of an aggregated service area may produce the benefit of reduced social conflicts – for example, where groups or individuals attempt to assume special privileges regarding tariff payments or the location of water points.

Finally, aggregation can also help in combining services that can be comparatively more financially attractive (such as piped water systems) with others that are important, but less attractive, such as the maintenance of handpump systems. In the absence of good regulation, however, the combination of different service levels such as piped systems and handpumps can prove problematic, however. For example, in the Eastern region of Burkina Faso (the only region where manual handpumps are in use), servicing those handpumps has been included in the remit of operators in charge of larger piped systems. However, as this activity is not attractive financially and regulation is limited, ensuring that the operators maintain these handpumps has proved somewhat difficult.[13]

[13] Hydroconseil (2010a).

Potential constraints of aggregation. With aggregation, villages and towns can lose direct control over investment and management decisions, so a village's particular priorities may be lost in the collective decision-making process. This concern can lead to high costs in reaching consensus on the formation of a single administrative unit to oversee a water supply[14]. Also, revenues and investments are not necessarily ring-fenced within individual villages, so conflicts can arise regarding financial issues. This can be exacerbated where high overheads associated with larger administrative units need to be recovered from the aggregated villages. Similarly, customers in towns may object to subsidizing smaller villages, while customers in villages may complain that larger towns are abusing their dominant position within the aggregated structure to influence the overall investment strategy and channel the majority of investments to the larger or more influential town.

One key risk of aggregation is that many of the potential benefits may only emerge for a sub-set of the villages or towns that form part of the aggregated structure (i.e. the "winners" from the aggregation process). It would therefore be important to provide incentives (financial and non-financial) to those users that benefit less from the aggregation process so they remain engaged in the process.

These potential disadvantages mean that aggregation often does not take place or fails because political will is lacking, the potential benefits are not clearly understood, or the process is perceived as too complex. If a purely voluntary process fails but the higher level of government sees merits to aggregation, the latter may offer premiums for aggregation (usually financial) or simply mandate the process.

It is therefore important to plan the process in advance as carefully as possible in order to minimize the risk of failure and to clearly enumerate all potential benefits. Considerable thought should go into defining the most appropriate size for grouping, depending on the potential for economies of scale and scope and increased attractiveness for private operators. More detail on how the aggregation process can be conducted, which services it can apply to (including small piped services versus handpumps) and how key decisions are made relative to the optimal type of grouping, are further discussed in Volume 2.

Range of aggregation options. Aggregated structures can take several forms. A list of key aggregation choices that need to be made is shown in Table 5.

Aggregated structures can group two or more neighboring local governments, or several LGs in a single region or across a broader territory. They can cover the provision of a single service (for example, bulk water supply) or all services. For each of these services, aggregated structures may carry out certain operational functions only or be responsible for all operational functions.

[14] This issue led to waning interest in the construction of large multi-village water systems.

Table 5: Aggregation choices

Key Characteristic	*Possible options (with increasing aggregation from top to bottom)*
SCALE	
What can be the scale of the aggregated structure?	A few neighboring towns and villages Numerous towns and villages , neighboring or at a distance All villages and towns in a pre-defined area Most villages and towns in the country ("national utility")
SCOPE	
What services can be aggregated?	Water production (bulk water sales) Full water supply services Water supply and sanitation (simple bundling) Water supply and sanitation bundled with other services (energy, solid waste, telecommunications, etc.)
What operational functions can be aggregated?	Operations and maintenance Management Procurement Investment finance All functions, with merging of assets and staff
PROCESS	
Should the aggregated structure be temporary or permanent? *What process can be followed?*	• Temporary, for a specific objective such as investment or access to private sector participation • Permanent, with practical limits on exit • Voluntary • With incentives (financial, political, etc.) • Mandatory

Source: ERM et.al. (2005)

4.3.2 Institutional implications: forming an aggregated institutional structure

From an institutional standpoint, two issues merit attention:

(1) Grouping the delegating authority. Where local governments are small either geographically or in total population, aggregation may only bring together a small number of water systems and water points unless systems from neighboring jurisdictions are included. Getting several local governments to jointly create a common asset holder can be a significant challenge, especially if local governments have a long history of political and financial autonomy. A typical arrangement is the constitution of an ad-hoc body such as an inter-jurisdictional group to hold the assets and tender any service contracts. This is an additional level of complexity that has been adopted for years in developing countries, and has been attempted with some success in several Latin American nations.

(2) Enabling effective regulatory capabilities. The aggregation process will create a new landscape with large service contracts of different types and more stakeholders interacting. This situation will require improving regulatory capabilities, which at present are non-existent in rural areas. Several viable options in this regard are explored in section 4.6.

Given the wide variety of different environments in which a FRUGAL project may be implemented it is impossible to be prescriptive about what would be the best institutional solution. However, it is likely that for many FRUGAL projects where several villages and towns have been aggregated, the Delegating Authority would take the form of an Asset Holding Company (AHC). AHCs are commonly used in the

urban water sector around the world, with many successful examples. They are most commonly used in conjunction with lease contracts, but may also be appropriate for other contract forms depending on the circumstances.

The AHC would either own the water assets, or would "hold" the assets on behalf of the villages and towns. AHCs are usually public companies owned by national or municipal government, but other legal forms can be considered. For instance the AHC could be established as a "not for profit" cooperative[15] partially or wholly owned by participating villages and small towns (also referred to as a "syndicate" in the francophone context).

The role of the AHC would include:

- acting as the public "guardian" of the water supply assets;
- undertaking the procurement of the private operator;
- monitoring the performance of the private operator, and reviewing and approving plans and programs prepared by the private operator;
- enforcing the contract;
- planning and financing the investment program in the aggregated service area;
- undertaking such other activities that have not been delegated to the private operator through the PPP contract.

4.4 Contracting arrangements

4.4.1 Rationale for private sector participation

The decision to use the private sector in the provision of water services may generate some controversy. Why then have so many countries chosen to use the private sector rather than having water services organized by the community or delivered directly by a local government?

The benefits of a private sector approach will depend on the model of private sector participation that is used, the scope of the services delegated to the private sector, and the type of private sector organization that is engaged.

The benefits may include:

- Stronger incentives to improve efficiency and ultimately deliver better value for money;
- Access to a wider pool of technical and management expertise, and exposure to "best management practice";
- Improving coverage and levels of service driven by the private operator's need to meet performance standards specified under the PSP contract, but also to increase revenues;
- Reduced direct government participation in the day-to-day running of the water services;
- Independence from some government procurement and human resources rules and regulations;
- Improved transparency and accountability brought about by separating the day-to-day operation of the water services (which is a role that can be effectively undertaken by the private

sector) from the roles of policy making and sector oversight (which remain the responsibility of government).

4.4.2 Contract form and risk allocation

There is a wide range of different models and approaches to Public Private Partnership (PPP) in the delivery of water services[16]. Higher risk forms of PPP, such as a concession in which the private sector finances new water infrastructure are unlikely to be feasible in the rural context. So these guidelines focus on the medium and lower risk PPP forms which are:

- lease contracts;
- management contracts;
- outsourcing contracts for specific services such as auditing;
- Design-Build-Lease (DBL) contracts;
- Design-Build-Operate (DBO) contracts.

These models are briefly described further below.

Lease Contracts

Lease contracts are widely used in the urban water sector. In the rural context, a lease contract could be structured as follows:

- Pre-existing water infrastructure (pipes, treatment works etc.) would be leased to a private operator for a predetermined contract period;
- The private water operator would operate and maintain the water system, deliver water services to customers, and undertake billing and collection;
- The private operator is paid from the water revenues (i.e. from the water bills paid by consumers).
- The private operator pays a "lease fee" to the Delegating Authority for rental of the assets and to cover the cost of supervising the contract with the private operator.

The Delegating Authority would be responsible for planning, financing and implementing new investment. In a fully self-sustaining water system the lease fee would cover the full cost of the Delegating Authority's investment obligations (including debt service and depreciation).

Lease contracts are usually only viable when:

- the water system is at or approaching full O&M cost recovery levels[17];

[16] A comprehensive description of available PPP models can be found in the World Bank Toolkit for Private Participation in Water and Sanitation, available: http://rru.worldbank.org/Toolkits/WaterSanitation/

[17] O&M Cost Recovery means in this case that the water revenues are sufficient to cover the day-to-day running costs, excluding debt service and depreciation.

- there is sufficient reliable management and financial data to allow prospective bidders for the lease to prepare their bids;
- the political, regulatory, technical, and commercial risks associated with the contract are consistent with the appetite and ability of the private sector to carry those risks;
- there is sufficient technical and financial capacity in the local private sector to prepare bids of reasonable quality and to undertake the services specified in the contract.

If these conditions do not exist then other PSP options may need to be considered.

Management Contracts

Under a management contract a private company operates and maintains the water system in much the same way as a lease contract. The key differences are that the private company's income comes in the form of a fee (rather than from consumer water bills) and the private company is not directly exposed to demand and operating and maintenance (O&M) risks (except when the remuneration of the operator includes a component linked to operating performance). As a result the management contract is a lower risk form of contract for the private sector.

Management contracts are often used in situations when a lease contract is not yet viable possibly because of low levels of cost recovery or the absence of reliable management and financial data. They are sometimes used as a precursor to a lease.

Outsourcing Contracts

Under the lease and management contract options, all operation and maintenance activities are undertaken by a private operator. An alternative approach would be to contract private companies to undertake specific functions such as: meter reading; billing; and revenue collection; planned and reactive maintenance. In the rural context they may be considered if the domestic local private sector does not have the full range of skills necessary to undertake a lease or management contract.

Design-Build-Lease and Design-Build-Operate Contracts

In situations where there is little pre-existing water infrastructure in place (in the form of pumps, boreholes, pipe networks, etc.) and a new water system and network needs to be created, then a Design-Build-Lease (DBL) or Design-Build-Operate (DBO) contract may be the solution.

These contracts are two stage contracts. In the first stage the private company would design and construct the new water infrastructure. The new infrastructure would be financed by the Delegating Authority, and the private company in effect acts as a contractor. In the second stage, following commissioning of the new works, the private company operates and maintains the new assets.

Under a DBL the second stage of the contract would be a lease (see description above), in which the private operator's income comes directly from the water revenues.

Under a DBO arrangement the second stage would be an "operations" contract and the private operator would be paid on a fee or "schedule of rate" basis. In this case the water revenues would be owned by

the Delegating Authority. The DBO contract model is more usually used for the construction and operation of discrete assets (such as a new water treatment plant) rather than for an entire water system. However, in conditions where a DBL is not feasible, a "comprehensive" DBO covering all the water system and all O&M services may be a good solution. The DBO model does not provide equivalent incentives to promote better commercial performance as the DBL. This weakness could be ameliorated with appropriate contract incentives.

The advantage of combining the design and construction of the water system under a single DBL or DBO contract is that:

- It creates stronger incentives for the private operator to develop efficient designs and engineering solutions that are cost effective in the longer term.
- The size and cash flow characteristics of the contract may make DBLs and DBOs more attractive to potential bidders. In particular domestic building and civil engineering contractors, who might otherwise be put off by the low financial returns and high political risks often associated with the water sector, may be attracted with a DBL or DBO.
- It would be easier to procure and supervise a single DBL or DBO contract than multiple contracts for design, construction and operations.

Intermediate approaches (contract variants)

In marginal situations, where the full lease may not yet be viable, a subsidized lease or subsidized DBL may be considered. If a subsidized lease is to be used, it is important that the subsidy mechanism is designed in such a way as to encourage investment in better and more affordable services (see section 4.5 for more details on financing arrangements)

These main options are summarized in Table 7.

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Table 7: Choosing the right Public-Private Partnership Contract Model

PPP Contract Model	Typical Duration	Scope	Risks carried by the private partner					Pre-conditions for implementation
			Tariff risk	Investment financing risk	Design & construction risk	Revenue risk	O&M risk	
Lease	10 – 15 years	O&M	-	-	-	✓	✓	• O&M cost recovery within 3-4 years • Reliable financial and management information about existing water system and consumers. • Sufficient financial capacity in the private sector to meet working capital requirements, • Sufficient technical capacity in the private sector to undertake the O&M services.
Management Contract	3 – 7 years	O&M	-	-	-	-	✓	• Access to funding to support costs of management contract • Sufficient technical capacity in the private sector to undertake the O&M services.
Outsourcing Contracts	2 – 5 years	Specified functions	-	-	-	-	✓	• Funding to support costs of contracts • Adequate technical capacity in the private sector to undertake the activities being outsourced
Design Build Lease	10 to 15 years	Design, Construction, O&M	-	-	✓	✓	✓	• O&M cost recovery. • Sufficient financial capacity in the private sector to meet working capital requirements, • Sufficient technical capacity in the private sector to undertake the O&M services. • It may be necessary to provide a minimum revenue guarantee
Design Build Operate	5 to 15 years	Design, Construction, O&M	-	-	✓	-	✓	• Sufficient financial capacity in the private sector to meet working capital requirements, • Sufficient technical capacity in the private sector to undertake the O&M services.

4.4.3 Types of operators: mobilizing the domestic private sector

In most cases, the size of the rural water businesses that will be created by forming aggregated rural utilities will be insufficient to attract and sustain international or regional players. A PRSA project would be expected to provide significant opportunities for the domestic private sector. This is exactly what has happened in the countries currently implementing a PRSA-type strategy.

Judgments will need to be made as to whether local firms have the technical and financial capacity to bid for and undertake the private sector contracts. Strategies for strengthening the local private sector may include:

- Providing local companies with subsidized access to specialist technical expertise to assist them in preparing bids and undertaking the contracts;
- Phasing-in implementation of private sector participation, for instance by starting with lower risk outsourcing contracts and progressively graduating to higher risk lease contracts;
- Encouraging collaboration between local domestic firms and more experienced regional firms.

4.5 Financing arrangements

As with any other water service, financing can come from a number of sources, including end-user tariffs (i.e. the charge that customers must pay to access the service), taxes (i.e. public subsidies from domestic government sources) and transfers from external sources (such as official development assistance or foreign workers' remittances). Non-tariff sources can either be non-repayable (i.e. grants) or repayable (i.e. loans, which can in turn be either concessionary loans or commercial loans, including microfinance).[18]

Rural water services are unlikely to be financed exclusively from tariffs, given that investment needs are high and local resources may be insufficient to cover the costs of providing the service. The concept of "sustainable cost recovery" therefore highlights that an appropriate mix between all these financing sources needs to be found, with end-user tariffs covering operating and maintenance costs and some percentage of capital costs. The experience with Output-Based Aid in Paraguay has shown that in some countries significant levels of cost recovery can be achieved in rural areas.

For each service, the optimal mix of financing sources will depend on a variety of factors, including:

- Affordability considerations: what are the maximum tariffs that customers can pay?
- Sustainability: what are the costs of service that need to be covered over the entire life cycle-costs of the installations?

4.5.1 Tariff setting and collection (user contributions)

Tariffs should be set in order to recover (at least) the costs of operating and maintaining the installations. Evidence from rural schemes shows that systems providing services for free to end-users

[18] More sophisticated types of repayable finance can include equity participations, bonds or guarantees, which have limited application in rural settings.

are not sustainable. In addition, covering at least a significant portion of initial capital costs is key to sustainable service delivery.

In community management models, a portion of initial capital costs (typically 5 to 10%) is usually requested as an up-front initial contribution from the community. In cash-constrained economies, part of this initial contribution is commonly made in the form of in-kind contributions, with community labor contributed for digging trenches for example. Under a PRSA type of arrangement, community cash contributions can be levied over time rather than as a lump-sum payment (or levied via connection charges in the case of piped water services), with the rest coming from an initial investment made by the Asset Holding Vehicle (i.e. a government body relying on public subsidies) or by the private operator (on a repayable basis). No matter which entity finances the initial investments, it will be essential to ensure that a depreciation allowance is recovered via the tariff so as to be in a position to replace the asset when it comes to the end of its useful life.

In order to estimate the level of tariffs that should be charged to reach financial sustainability, the costs of running the service and the revenues from the service would ideally be projected over the long term (10 to 15 years), taking account of the potential for efficiencies stemming out of service aggregation.

4.5.2 Securing and channeling subsidies

In most cases, given affordability constraints in rural areas and the potentially high costs of extending water services, it is likely that initial investment costs will need to be subsidized to some degree. In the context of a PRSA model, subsidies are most likely to come from the central government or international donors, either directly or through a sector-wide financing mechanism that enables financing coordination (such as a common fund or a water sector development program).

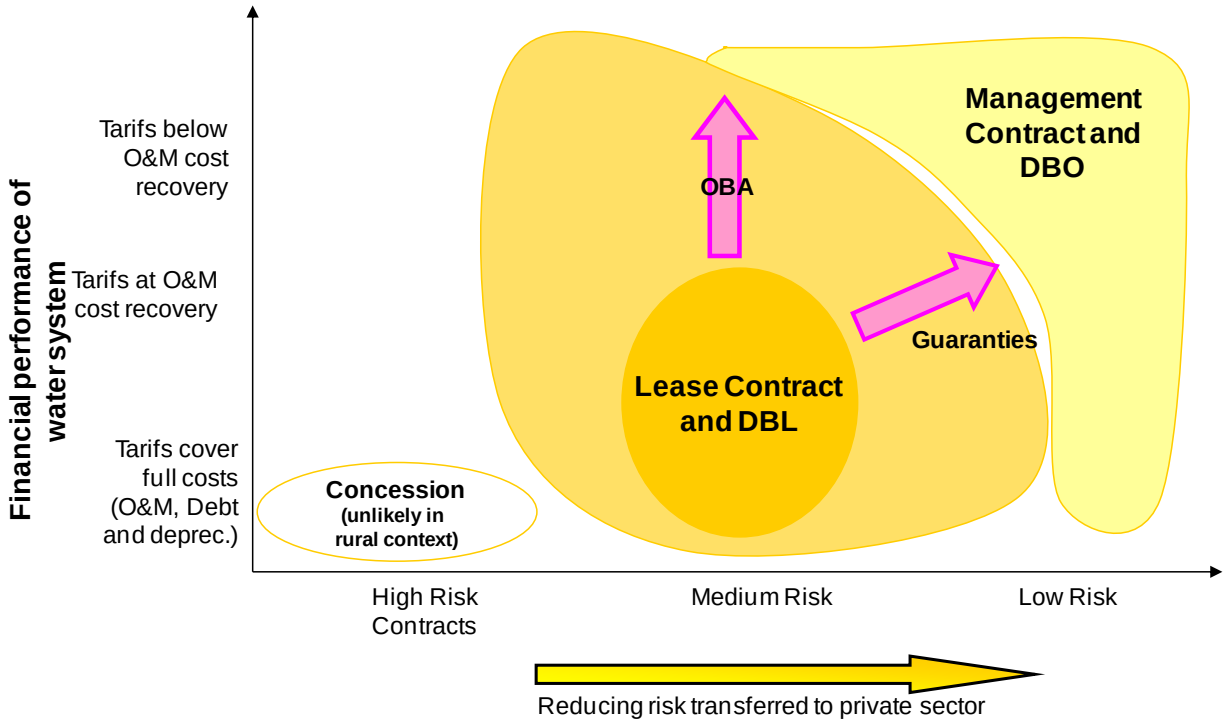
Delivering the subsidy based on results (i.e. following Output-Based Aid principles) can help with improving the targeting and, therefore, the sustainability of these subsidies. In an OBA scheme, the full amount of subsidy is paid to the beneficiary (private, public, or community operators) only once the expected results have been achieved and verified by a third-party. Subsidies are provided ex-post, once the outputs have been delivered, which means that the service provider bears some financing and performance risk. This also encourages the use of private sector funds (leverage), which are usually needed to pre-finance a large portion of the costs. However, such pre-financing can represent a significant financial commitment for small-scale independent providers (SSIPs) involved with the provision of water or sanitation services. As a result, some mechanisms such as the provision of micro-finance loans to help cover the costs of the initial cash outlay by the private sector operator may be needed especially when the private operators have limited financial capacities (this has been successfully implemented in Kenya for small towns water supply, where OBA subsidies were combined with microfinance loans from a reputable local bank, K-Rep).

OBA subsidies are particularly well suited to the PRSA model as they can be paid directly to the operator based on results (such as the number of new connections delivering a sustainable service over a given period of time, such as six months to a year). They can also help with targeting the subsidies so as to lift

affordability constraints where they exist (for example, a connection subsidy could be paid only for new connections provided in difficult to reach or poor areas).

Figure 4.5 below shows the likely range of applicability of the main PRSA type contracts. It shows, for example, that OBA subsidies or guarantees can help extend the applicability of a lease contract or DBL even in circumstances where tariffs are well below O&M cost recovery. Management contracts may need low or no subsidies for the private operator (who bears limited risks), although in that context, subsidies are likely to be needed in order to lift the affordability constraints and to support investments to be carried out by the public sector.

Figure 4.1: Intermediate Contract Approaches and financing arrangements



4.6 Defining a monitoring framework

A monitoring and evaluation framework must be established in order to assess overall progress in implementing the planned expansion plan; the performance of the operators and specialist service providers; and eligibility for financing (particularly in the case of output-based aid). Indicators may be either of a pass/fail type (for example, sub-project milestones that must be met as a condition of financing), or numeric (for example, relating to technical or financial operational performance.)

In cases where external financing is an important condition for delivering planned improvements, it will be important to agree with the financing body or government facilitator on the required level of performance or achievement of sub-project milestones (or the delivery of some pre-specified outputs) to unlock financing.

Beyond simple contract monitoring, regulation should also be carried out in order to set tariffs, establish and enforce service standards, resolve conflicts, overview competition t in the event of several providers in place, and resolve customer complaints.

Potential mechanisms for carrying out the regulatory role include:

- Self-regulation: the aggregated entity (the AHC, Asset Holding Company) assumes this task and sets the tariffs itself. This would not be a preferred solution as it generates clear conflicts of interest;
- Contract-based regulation (without or preferably with third-party auditors), which would rely on a well-specified contract between the AHC and the private operator and would set out most of the values for key parameters (such as tariffs or quality) in advance. Due to the difficulty of writing comprehensive contracts, however, it would always be necessary to establish a contract adaptation mechanism to deal with circumstances that could not be foreseen at the time of writing the contract. This can take the form of an independent expert in charge of adjusting the parameters of the contract. Depending on the relation with a central ministry, an official from the appropriate ministry could play the role of independent expert to settle disputes between the AHC and the private operator.

Water User Associations and customers can also help with monitoring day-to-day service quality and relaying information to the authorities in charge of regulation, as well as represent customers. If they were to assume such role, it would be necessary to organize the transition so that WUAs can switch from their role as operators, to which they may be accustomed, to one of monitoring. This is likely to require training and an initial adaptation period.

5 Conclusion: evaluating the applicability of the PRSA model

Any comprehensive approach implies risks of one kind or another. PRSA is no different. Early recognition of these risks and attention towards reducing them will greatly assist in the likelihood of long-term success. A list of potential risks is provided in Table 8. While some proposed risk mitigation strategies are suggested, it should be mentioned that most risk factors and their mitigation must be addressed at the country or sub-national levels.

Main risk categories include:

- Risks relating to domestic private operators;
- Financial risks;
- Political constraints;
- Social issues;
- Environmental factors.

Table 8: Some potential risks and risk mitigation strategies for PRSA implementation

Potential Risks	Possible Risk Mitigation Strategies
Extremely low-population-density areas (or areas of extreme poverty) may fail to produce the expected results	Pre-feasibility and feasibility studies include analysis of the effects of low-population densities (and poverty levels) on the overall cost structure of PRSA, and its probability of success
Local governments may not look favorably upon aggregation, especially if it includes cross-jurisdictional service area formation	Research suggests that cross-jurisdictional service areas are feasible only where aggregation is legally mandated and given an appropriate support framework; promotional, informational, and training efforts at the local level will be needed in the early stages of implementation
Corrupt practices or poor contract management may interfere with efficient operations over large areas	Initial implementation may require capacity building at all levels, and increased scrutiny into procurement processes; annual oversight at the regional or national levels may be exercised
Natural disasters may have severe consequences on short to medium-term operations over wide areas	Contracts must include specific protocols in the case of natural disasters affecting operations and/or users abilities to pay in either the short or medium-terms; operators must have in place disaster planning protocols depending on specific local risks
Long-term public funding guarantees may not be respected, especially after major political changes	Long-term contracts may be backstopped at regional or national levels; long-term funding commitments from specific donors or SWAPs may be pursued
Unfair commercial advantages may accrue to long-term operators, especially if they bundle several services	Bundling of services should be addressed in all contracts, and conflicts of interest defined; bundling of services could be limited to public services, precluding specific commercial ventures
The use of alternative water sources in order to avoid tariff payments may negatively affect revenue streams, and undermine service quality	Analyses must be conducted during pre-feasibility and feasibility stages around the availability and use of alternative water sources; accurate consumer demand and willingness to pay calculations are both critical to estimating the likely use of no-cost alternative water sources
Domestic private sector deficiencies do not lead to expected benefits	Pre-feasibility and feasibility analyses must estimate local private sector capacity to provide long-term, high-quality services; all contracts to have clear rescission clauses that include failure to perform or failure to maintain a trained workforce
Private sector rent-seeking behaviors may lead to service improvements for some at the expense of others	Protocols must be in place to ensure that higher service levels can only be offered where these do not create negative impacts on those with lower service levels: for example, water volumes and network capacity must be adequate before providing house connections
Poor initial estimates of commercial risk may lead to deficient operations	Accurate consumer demand and willingness to pay calculations form a critical step in the pre-feasibility and feasibility stages. Operational cost estimates must likewise be conscientiously developed and vetted before tendering
Tariff setting may become contentious if operational costs vary widely within a single service area	Tariff setting and modification protocols need to be clearly defined contractually, and in concert with users; the right to be able to set tariffs locally is essential to a successful model
Political determinations of the use of investment funds may represent poor commercial and or operational choices	New construction and/or rehabilitation must eventually become part of a master plan within the service area in order to avoid situations where certain new service areas are exceptionally expensive to operate, or beyond the skill levels of the local operators
Obligations of private operators are more onerous or stringent than those placed on community-operated services, leading to abandonment of the PRSA model by user groups due to apparent cost savings	A level playing field must be prepared such that all services are held to the same standards of quality over a pre-determined timeframe: for example, performance standards for both private operators and community operators must be identical so that professionalized service delivery becomes the standard in all rural areas

Additional risks are likely in response to local conditions, and each country has the responsibility of gauging these risks in the early stages of design of the PRSA strategy. Despite the risks, multiple countries have already shown the rewards associated with using novel approaches to rural service provision. Sustainable rural service delivery is the ultimate prize, and the PRSA approach may represent a successful way of ensuring long-term functionality, quality, and user satisfaction in rural areas.

Practical advice and recommendations for testing the applicability of the proposed approach can be found in the accompanying implementation volume (Volume 2).

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