

**Rural Water Supply Series**

56557

**A global review of private operator experiences in rural areas**

# Private Operator Models for Community Water Supply

Poor cost recovery and the 'feast or famine' project approach to funding have hurt the sustainability of rural water supply and impeded scaling up coverage. This Field Note highlights findings from a global review of private operator experiences in rural areas.



The current rural water supply paradigm may be best described as ‘feast or famine’ project-based funding linked with community management of the installed infrastructure.

## Summary

**In cities and towns, private firms and individuals receive contracts to build, operate, and maintain municipal water supplies as an alternative to day-to-day management by local government or user organizations. A literature review has uncovered a wide variety of approaches from around the world for establishing such Public-Private Partnerships (PPP) in rural areas as well. Within the past seven years, several authors have completed reviews on private operators managing rural water supplies and other public services. In Aguateros, Paraguay, a consensus was found among these reviews that: markets exist for high quality services in rural areas; policy changes in support of private operator models can follow from successful pilot projects, if at the outset there exists a legal basis for contracting a private operator to supply water services; contracts using local government and communities to monitor private operator compliance are a more practical approach to regulation than utilizing a dedicated regulatory body; and financing and subsidies will almost surely be necessary for capital investment in the short to medium-term. These early lessons learned have led the Water and Sanitation Program (WSP) to conceptualize a more comprehensive approach to PPP in the rural context. The concept is surprisingly simple. A private firm or individual would receive a long-term government-let contract to design, build or rehabilitate, operate and/or maintain water supplies within a defined geographical area. This aggregated service area would include both small towns and remote villages. This concept has coined the acronym FRUGAL, for *Forming Rural Utility Groups and Leases*.**

a significant advantage over international firms, as the scale of operations decreases. As more and more small towns come under improved local private sector management regimens, it is expected that PPP in the disperse rural context will expand as well.

The current rural water supply paradigm may be best described as ‘feast or famine’ project-based funding linked with community management of the installed infrastructure. This approach has a number of significant problems that are increasingly becoming troublesome:

- Funding is unpredictable from one year to the next, with periods of massive investment interspersed, with periods of little or no investment, therefore making even short-term sector planning almost impossible;
- Poorer, dispersed, and less organized communities tend to be excluded;
- Post-construction follow up is minimal or non-existent;
- The management capacity of local water committees, despite intensive initial training, drops dramatically over time as trained people lose interest, lack access to skills upgrading, or simply move away;
- Operations and maintenance cost recovery is spotty - either too much is raised and a large surplus fund attracts the unscrupulous, or more often than not, too little is raised and when repairs are needed there is a shortfall;
- As rural water supply systems become more technologically complex or as the number of users increases,

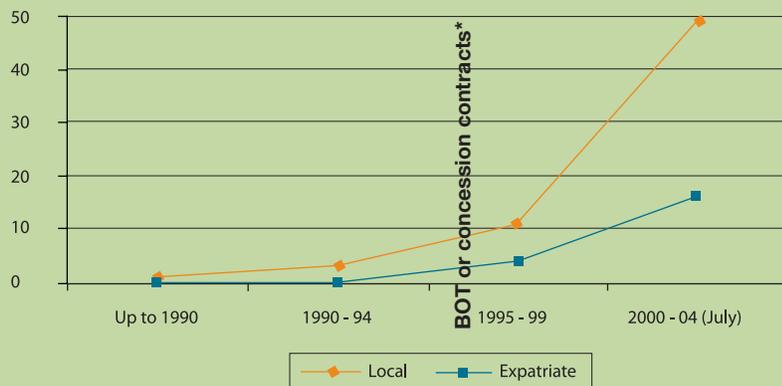
## Background

The need for new approaches to water service delivery responds to the substantial changes taking place today in rural areas around the world: incomes are rising; transport, communications, and commercial networks are expanding; and rural people are demanding access to

quality services for which in many cases, they are willing and able to pay for.

In addition, the participation of the domestic private sector in water supply projects has been growing rapidly over the past decade, as suggested by the Asian experience reflected in Figure 1. The domestic private sector in fact holds

Figure 1. Water coverage



Source: IIED. Coverage: Asia - Malaysia, Thailand, Philippines, China, India; Scope: Contracts with minimum duration of 10 years and 10,000 customers. Note: BOT stands for Build, Operate, Transfer.

customer-operation becomes more of a challenge;

- Investment cost recuperation characteristically stops completely once a symbolic up-front payment has been made; and,
- Spare parts for routine maintenance, trained mechanics and equipments for handling major repairs may be difficult to find, which may result in the infrastructure sitting idle for long periods of time.

These problems mean that increases in coverage are limited to what government line departments and aid agencies can finance and implement, which is never enough to meet the demand, and failure rates are high, because sooner or later, a particular repair or spare part is required but is beyond the reach of the local user group. This leads to infrastructure breakdown, water stops flowing, and arduously gained coverage is lost.

## Recent Literature on Private Operators in Rural Water Supply

Within the past seven years, several authors have completed reviews of private operators managing rural water supplies (Econ One Research 2003; Kariuki and Schwartz 2005; Requena and Triche 2006; Triche, Requena and Kariuki 2006; Vezina 2002; Valfrey-Visser et al 2006; WSP-AF and AFD 2006).

The following findings were reported in two or more of the preceding studies:

- Markets exist for high quality services that cater for rural customers' lifestyles and preferences;
- National legislation, policies, regulatory agencies, and so forth, may not be a necessary first step in promoting local private operators. Further, sector

reforms can follow from successful pilot projects, especially if they have a donor or other champion. However, there should at least be a legal basis for contracting a private operator to supply water services, and performance standards should be flexible rather than nationally uniform;

- Contracts using local government and communities to monitor compliance are a more feasible approach to regulation, than utilizing a dedicated regulatory body; and,
- Financing and subsidies for capital investment will almost surely be necessary. Contracts incorporating Output-Based Aid<sup>1</sup> can be an effective way to deliver subsidies. In addition, financing from users paying for their connections is a good way to raise capital for expansion.

Valfrey-Visser et al (2006) make an additional point worth emphasizing: the political will of government to encourage private operators is a significant variable to success. In Ghana, the government created the Community Water and Sanitation Authority with a mandate largely to support community management. In Mauritania, the government created Agence Nationale D'Eau Potable et D'Assainissement, Mauritanie (ANEPA), whose role is to supervise and support management by local operators.

<sup>1</sup>Output-Based Aid (OBA) is an approach used to promote the effective use of public funds for the delivery of infrastructure services. Governments normally delegate service delivery to a private sector firm under contracts that tie the disbursement of public funds to actual service delivery to targeted groups. This performance-based subsidy is generally applied where service affordability is a critical issue requiring public funding to complement or replace user fees.

Demand for basic services from rural households is not only strong, but is characteristically backed-up by a strong culture of payment.



Water tank in Paraguay

Small town water supplies today perform better in Mauritania than in Ghana as a result (Ibid, p. 14).

## Project and Policy Experiences

Box 1 gives a summary of how rural households make good customers. Other types of experiences are explored below in more detail.

### I - Private Services and Support

A few of the reviewed projects or policy initiatives did not use the private sector as

operators. Instead, private firms provided services and support that previously the government would have extended to the local institutions or organizations managing the water supplies. Mali provides a good example of this. A German-assisted project in the 1990s established a central government office to provide technical and financial support to piped water networks in small towns (the smallest of which have populations of under 2,000 inhabitants). Later, the government contracted this function out to two firms. The local user associations still manage their schemes, but the firms give the associations technical advice on problems, review repair invoices, and audits the associations' books (Vezina 2002; WSP-AF 2006).

A very different example comes from South Africa. In 1997, the central government began to decentralize to local governments the responsibility of constructing and managing water supplies. Local governments, however, in most cases, lacked the capacity to handle these new responsibilities.

The central government therefore awarded Build-Operate-Train-Transfer (BOTT) contracts, under which a private consortium would win the contract to act as the Project Implementing Authority (PIA) in a province. Acting as the PIA, the private firms develop in coordination with local governments, technical and institutional plans for water and sanitation services that would then be submitted to the central government for approval and funding. Once approved, the PIA then assists the local government with construction supervision and provides training and planning for operation and maintenance. Upon completion, the infrastructure is transferred to the local government, as envisioned in the decentralization act (Trémolet and Browning 2002).

### II - Private Operators

Many projects and policies covered in the literature survey employed the private sector as some type of operator, and Table 1 indicates the variety of ways in which this was done. For instance, in Gabon, Senegal and Côte d'Ivoire, contracted large domestic firms are wholly or partially-owned by international firms to manage the piped water networks in urban areas, as well as small towns and rural growth centers (Trémolet and Neale 2002; Trémolet, Browning, and Howard 2002). Ecuador and India provide examples where

### Box 1: Rural Households Make Good Customers

Investigators have consistently been surprised to discover that demand for basic services from rural households is not only strong, but is characteristically backed-up by a strong culture of payment, as shown by examples from countries as diverse as Bangladesh, Vietnam, Paraguay, Cote d'Ivoire, and South Africa. Experience from Senegal and Cote d'Ivoire has in addition shown that when compared to urban customers, rural customers are not only better at paying their bills, but are less likely to engage in theft or service fraud (Econ One Research, Inc. 2003, pp.8-9).

private firms have been contracted to provide bulk water to villages within which operation and maintenance of the network falls under the responsibility of local governments or water boards (Drees-Gross et al 2005a; Srivastava and Sharma 2004). Many projects have contracted with the private sector to manage the water supplies - usually a piped network - in one or a few settlements of the size envisioned in FRUGAL. In several instances, this is simply the result of extending the small town model to very small rural settlements.

The World Bank project in Cambodia is such an example (Requena and Triche 2006). So is the World Bank pilot component in the Paraguay rural water and sanitation project, except that in this

case, the design of the component had two noteworthy innovations. An Output Based Aid approach was used, and firms had to bid on the size of the subsidy that they would require per connection from the government in order to build the specified systems. The firms then had to recoup the non-subsidized portion of costs and profit through collecting water charges and connection fees.

The second interesting feature is that construction firms which were awarded the contracts had to partner with small scale independent providers *aguateros* who then operated the schemes on behalf of the consortia (Drees-Gross et al 2005b; Requena and Triche 2006). A special category of local scheme operators are those who entirely or largely raised the financing for scheme construction by themselves. In Tien Giang Province, Vietnam, this happened without any project intervention (WSP-EAP 2004). In Cambodia and Laos, a French NGO supported and facilitated scheme construction that local entrepreneurs had initiated on their own (Ibid; Salter 2003; GRET 2005). The World Bank Social Investment Project in Bangladesh is attempting to get communities and local government to raise on their own, at least 50 percent of the financing for rural piped water schemes that would then be run by private operators.

The Rural Development Academy has implemented rural multipurpose water schemes through NGO or private operators in which consumers pay 100 percent of capital costs over a period of 10 to 15 years (excluding financing charges) through their monthly water bills. Senegal is just beginning to implement a national policy which favours private

operators in the rural water sub-sector. The new policy developed out of a pilot project, Régefor (*La Réforme de la Gestion des Forages*) under which each participating user association hires a private operator to manage a scheme, consisting of a motorized borehole, elevated water tank and distribution network. The operators depend on a national firm that has been awarded the maintenance contract for repairs and an annual preventative maintenance check-up (WSP-AF 2005, 2006). Mauritania has taken a similar approach, with a national government agency being responsible of repairs, except for solar pumps, which are delegated to a national private firm (WSP-AF 2006).

### Box 2: Relating technology choices and management choices

Rural water supply commonly subscribes to the Village-Level Operation and Maintenance, or VLOM concept. VLOM-type handpumps are designed to be repaired and maintained locally using a minimum of specialty tools and services so that village-based caretakers can address most if not all service problems. As a result, handpumps are not only simple to repair, but tend to frequently break down or require maintenance.

A private operator would not tolerate repeated breakdowns as expected under VLOM, and would prefer to specify more robust (though more complex to repair, and normally more expensive to install) handpump models.

FRUGAL represents a potential response to problems associated with the ‘project approach’ to rural water supply coverage, in which periods of massive investment are followed by periods of little or no investment.

Burkina Faso is now testing in 13 provinces a new strategy under which a private firm is awarded a handpump maintenance or a handpump installation and maintenance contract, in one or more communes (districts). Smaller firms get the handpump maintenance contracts covering one or two neighboring commune, while larger firms get the handpump installation and maintenance contracts covering several communes in a region. In the case of piped water schemes, the commune contracts a

private operator to manage each system ([www.reforme-aep.org](http://www.reforme-aep.org)). Other reviewed projects which involved handpump maintenance contracts were either unsuccessful or less promising. The Côte d’Ivoire utility company, Societe de Distribution d’eau de la Cote d’ivoire (SODECI), had a contract from 1972 to 1986 to maintain rural handpumps, but the company neither did a very good job of this, nor found the activity profitable (Trémolet, Browning, and Howard

2002). The French firm Vergnet, had a less successful experience with offering maintenance contracts of its installations, whether for preventive maintenance only or for a comprehensive plan of preventive maintenance, repairs, and spare parts. The company established that such contracts require village committees that are willing and able to collect user payments, manage the funds responsibly, carry out ordinary pump upkeep, and control disputes within the committees.

**Table 1. Private Sector Participation in the Maintenance of Improved Water Supplies in Small and Dispersed Rural Settlements\***

Types of Private Sector Participation	Descriptions	Examples
<b>I. Services and Support</b>	Provide services formerly performed directly by government.	
(a) Planning and Construction Services/Community Training	Assist local government or community groups to plan and design infrastructure, supervise construction; provide training and planning for operation and maintenance.	Programa Nacional de Agua y Saneamiento Rural, Peru (PRONASAR), Peru Build-Operate-Train and Transfer (BOTT), South Africa
(b) Post-Construction Services	Provide technical advice, auditing services, preventive maintenance, and/or repair services to government or community organizations managing water supplies.	Suivi Technique et Financier, Mali (STeFi), Mali
(c) Handpump Maintenance Contract	Private contract to maintain handpumps.	Management Reform Project, Burkina Faso, Vergnet Basic and Total Warranties, Catholic Diocese Project, Kenya*
<b>II Operations</b>	Private sector operates and maintains supplies; or in the case of handpumps, maintains supplies.	
(a) National Utilities	Private contract to manage schemes in urban centers and small towns, some of which under 2,000 population.	Société d’Electricité et d’Eaux du Gabon (SEEG), Gabon Societe de Distribution d’eau de la Cote d’ivoire (SODECI), Côte d’Ivoire Société Nationale des Eaux du Sénégal (SONES), Senegal

**Continuation Table 1. Private Sector Participation in the Maintenance of Improved Water Supplies in Small and Dispersed Rural Settlements\***

Types of Private Sector Participation	Descriptions	Examples
(b) Bulk Water Supply	Private contract to manage production and transmission of water in network serving multiple settlements; local government or community organization handles distribution within settlement.	Songaon-Mekhali scheme, India  Proyecto de Agua Potable y Saneamiento para Comunidades Rurales y Pequeños Municipios, (PRAGUAS), Ecuador
(c) Piped Scheme Operator	Private contract to operate and maintain supplies in one or more settlements.	Rural Water and Sanitation Project, Paraguay  Régefor, Senegal  Village Operators, Mauritania  Management Reform Project, Burkina Faso  District Government Contracts, Rwanda
(d) Piped Scheme Owner-Operator	Private operator also owns all or part of supplies.	Mini Research D'eau Potable - Cambodia- Laos (small scale piped water system under public-private partnership - MIREP), Cambodia and Laos  Tien Giang Province schemes, Vietnam  Social Investment Project, Bangladesh  Water Health International
(c) Handpump Maintenance Contract	Private contract to maintain handpumps.	Management Reform Project, Burkina Faso,  Vergnet Basic and Total Warranties,  Catholic Diocese Project, Kenya*
(e) Mixed Piped Scheme Operator/Handpump Maintenance	Operator of piped scheme in small town has handpump maintenance contracts for neighboring villages.	SODECI, 1972-86, Côte d'Ivoire  Huila Province Water Brigades, Angola*  Nkana Water and Sewerage Company, Zambia (NWSC), Zambia

**Note:** \*Kenya and Angola experiences do not use the private sector, but have interesting similarities to other aspects of the FRUGAL model.

**Other Notes:** This typology does not include the types of private sector participation envisioned in the usual community management models or for self supply.

It also does not cover private sector participation that is limited to design or construction. 'Private sector' does not include NGOs, community organizations, cooperatives, and so forth. 'Small, dispersed rural settlements' means that the populations are about 2,000 people, and that the villages are far-removed physically from small towns or rural centers to be considered settlements in their own rights.

The FRUGAL concept is an effort that attempts to develop a more comprehensive approach to PPP in rural areas.

Majority of village committees did not display these traits<sup>2</sup>. Similarly, other experiences with handpump maintenance contracts have either failed or not yet shown promising results.

Given the fact that nearly half of all Africans living in rural areas obtain their drinking water from handpumps (RWSN 2007), finding a mechanism for keeping widely dispersed handpumps functioning over time is critical to meeting the MDG targets in the continent.

## The FRUGAL Concept

FRUGAL represents a potential response to problems associated with the 'project approach' to rural water supply coverage, in which periods of massive investment are followed by periods of little or no investment. At the same time, the FRUGAL model is conceived to improve coverage and sustainability by improving cost recovery, as well as addressing problems that the community management model has experienced in some situations. A few initiatives, as described in the literature, conform to the FRUGAL concept quite closely, particularly the private operator model being developed in Burkina Faso.

As an emerging model, FRUGAL would have the following key characteristics:

- An aggregated service delivery area would be created for the long-term provision and/or maintenance of water supplies, including everything from small towns to the smallest village

<sup>2</sup>Personal communication with Dominique Bouzerma, Vergnet Hydro. This is not to conclude that the users themselves are primarily responsible for system breakdowns!



Water operator using a motorcycle cart

within the service zone, as a way of creating scale in the rural context;

- Legal ownership of all infrastructure would be maintained by government or communities;
- State investment funds (and other private funds) for the construction of new infrastructure, and the rehabilitation or reconstruction of pre-existing infrastructure, would gradually be channeled through the local operator of the service area making funding levels more constant and predictable; and,
- Users would regularly pay for high-quality service, leading to full operation and maintenance cost recovery, and significant investment cost recovery over time.

A local operator with an entrepreneurial orientation might also be expected to better respond to consumers' needs and desires, and to create synergies over time for the bundling of additional services, such as power or telecoms. At its heart, FRUGAL is an approach which is designed to improve rural water supply scalability, functionality, and cost recovery over the long-term. Table 2 demonstrates that there is wide latitude in establishing a FRUGAL-type arrangement, in response to local laws, national policies, and social conventions.

The National Utility in Gabon (SEEG), for example, is characterized by the elements highlighted in green. By way of contrast, the Community Management model is characterized by the elements highlighted in orange. Any combination of elements that includes aggregation might

**Table 2. Rural Water Supply elements that can be combined to form a unique management model**

Service Provider	Scale	Type	Scope	Client Base	Service Level	Aggregation
Utility <sup>A</sup>	<ul style="list-style-type: none"> <li>National</li> <li>Regional</li> <li>Local</li> </ul>	<ul style="list-style-type: none"> <li>Public</li> <li>Private</li> <li>Hybrid, Public-Private</li> </ul>	<ul style="list-style-type: none"> <li>Single Service</li> <li>Multiple Services</li> </ul>	<ul style="list-style-type: none"> <li>Urban + Rural</li> <li>Rural only</li> </ul>	<ul style="list-style-type: none"> <li>Piped Supply</li> <li>Non-Piped Supply</li> <li>Piped + Non-Piped</li> </ul>	<ul style="list-style-type: none"> <li>No, a single system</li> <li>Yes, multiple, discrete systems</li> </ul>
Non-Utility <sup>B</sup>	<ul style="list-style-type: none"> <li>Regional</li> <li>Local</li> </ul>	<ul style="list-style-type: none"> <li>Public</li> <li>Private</li> <li>Hybrid, Public-Private</li> </ul>	<ul style="list-style-type: none"> <li>Single Service</li> <li>Multiple Services</li> </ul>	<ul style="list-style-type: none"> <li>Urban<sup>B</sup> + Rural</li> <li>Rural only</li> </ul>	<ul style="list-style-type: none"> <li>Piped Supply</li> <li>Non-Piped Supply</li> <li>Piped + Non-Piped</li> </ul>	<ul style="list-style-type: none"> <li>No, a single system</li> <li>Yes, multiple, discrete systems</li> </ul>

<sup>A</sup> 'Utility' is defined here as a highly-organized, professionally-staffed, water service provider, normally regulated by a fully independent government agency. There is no complete exclusive definition of 'utility', and some arrangements could conceivably be difficult to classify with confidence. The definition above, however, should be able to accommodate over 95 percent of all cases.

<sup>B</sup> In the Non-Utility case, 'Urban' is more likely to refer to small towns, and not large urban centers. The exact point of differentiation between the two may be difficult to clearly define.

Source: Adapted from Water for People.

be considered feasible under a FRUGAL framework. The possible combinations are therefore many, though not all may be practical. It is unlikely, for example, that a national- private - rural - utility would be formed. But it is feasible for a local-private-service-provider to be formed, for supplying water both to small towns and disperse rural areas.

This categorization is fluid as one combination of elements may lead into another over time. In Rwanda, for example, individual entrepreneurs have been managing rural water systems through contracts with the local government. Some entrepreneurs are now managing several discrete systems and are overseeing in many cases, the expansion of service delivery by adding house connections in order to increase their receipts and incomes, while augmenting the number of

staff working under them (WSP-AF 2008). System management is not the only core element that needs to be examined in order to describe the possible universe of rural water supply approaches. Other critical components, including financing, subsector planning and policy making, research, technical assistance, and capacity building must also be considered. Nonetheless, the most distinguishing element of FRUGAL is some level of service aggregation.

## Conclusions - further development of the FRUGAL concept

This brief literature review demonstrates a wide range of private sector and PPP initiatives underway around the world.

The fact that such a variety of efforts can be documented suggests that the search for alternatives to community management is a natural and growing response by communities and policy-makers to improve rural water supply services. The FRUGAL concept is an effort that attempts to develop a more comprehensive approach to PPP in rural areas.

While it is clear that new approaches are being explored, it is also clear that a more rigorous assessment needs to be made for certain critical elements of these initiatives, including: dealing with low-population-density areas; developing an effective regulatory framework in the rural context; correctly estimating the cost recovery potential across a service area; creating viable service areas across multiple local government jurisdictions; understanding relationships between technology choices

PPP and service area aggregation appear to be major new policy elements in achieving improved and sustainable rural water supply services.

and management choices; assuring a steady flow of investment funds over time; setting and collecting tariffs; identifying the types of consumer safety nets and operator risk mitigation that might be needed; and, understanding and utilizing the existing legal framework.

Of the world's population that currently has no access to improved water supplies, more than 80 percent live in rural areas. This makes the search for improved service delivery models to the rural populations not only a global imperative for meeting the MDG targets, but is key to providing a long-term solution for water service delivery to the world's poorest citizens. PPP and service area aggregation appear to be major new policy elements in achieving improved and sustainable rural water supply services.

As a follow-up to this literature review, several case studies of domestic private sector participation in rural water supply are on-going in six countries: Burkina Faso, Senegal, Niger, Rwanda, Paraguay, and Cambodia. Final results are expected to be reported by February 2010. Along with these case studies a series of workshops are planned in order to draw out the latest lessons learnt and to assist in drafting the guidelines for developing the FRUGAL concept on a pilot basis in interested countries.



A water treatment plant in rural Cambodia



Water quality control is a requirement for private operators

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## About the series

WSP Field Notes describe and analyze projects and activities in water and sanitation that provide lessons for sector leaders, administrators, and individuals tackling the water and sanitation challenges in urban and rural areas.

The criteria for selection of stories included in this series are large-scale impact, demonstrable sustainability, good cost recovery, replicable conditions, and leadership.

The findings, interpretations, and conclusions expressed are entirely those of the author 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 companies they represent.

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WSP's mission is to support poor people in obtaining affordable, safe, and sustainable access to water and sanitation services.

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