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# Evaluation of Small-scale Providers of Water Supply and Sanitation Services in Peru



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Lima, June 2007

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# Acronyms and abbreviations

<b>APPJ</b>	Water Supply in the Pueblos Jóvenes (Shantytowns)
<b>BOOT</b>	Build, Own, Operate, Transfer
<b>COVAPS</b>	Neighborhood Water and Sanitation Committee
<b>FNI</b>	National Investment Fund
<b>GDP</b>	Gross Domestic Product
<b>IBRD</b>	International Bank for Reconstruction and Development
<b>IDB</b>	Inter-American Development Bank
<b>JASS</b>	Sanitation Service Administrative Board
<b>MEF</b>	Ministry of Economy and Finance
<b>MOA</b>	Ministry of Agriculture
<b>MOH</b>	Ministry of Health
<b>MVCS</b>	Ministry of Housing, Construction and Sanitation
<b>NGO</b>	Non-governmental organization
<b>PAHO</b>	Pan American Health Organization
<b>PRONASAR</b>	National Rural Water Supply and Sanitation Project
<b>PSP</b>	Private sector participation
<b>SEDAPAL</b>	Lima Water and Sewerage Company
<b>SENAPA</b>	National Water Supply and Sanitation Service
<b>SNIP</b>	National Public Investment System
<b>SP</b>	Service provider
<b>SSP</b>	Small-scale providers
<b>SUNASS</b>	The National Superintendence of Sanitation Services
<b>WSP</b>	Water and Sanitation Program

**Exchange rate**  
US\$ 1 = S/. 3.2  
S/. 1 = US\$ 0.31



## Executive Summary

- (i) The objective of this study is to identify the reasons for the existence of small-scale providers of water supply and sanitation services (SSP) in Peru and to evaluate the experience of these operators, with an emphasis on their coverage, service quality, costs and sustainability. The evaluation also includes proposals to improve service to the market traditionally served by SSP.
- (ii) The study was divided into three phases: (a) a sector assessment to determine why sector policies and financial and institutional resources have not produced service provision to the entire population, particularly to the segments served by SSP; (b) surveys in 14 communities with SSP and an analysis of responses to questions pertaining to legal, technical, market and financial aspects, as well as consumers' perceptions; and (c) sector policy recommendations with respect to SSP, and suggestions for priority projects to support better service delivery.
- (iii) The National Plan for the Water Supply and Sanitation Sub-sector estimates that 6.7 million (24%) of Peru's 27.5 million people do not have access to water supply services and 11.8 million (43%) lack sanitation services.
- (iv) With a view of identifying the different types of service provided to the 'unserved' population, the Ministry of Housing carried out a rapid assessment of households without service in the jurisdictions of water utilities in October 2006. This study demonstrated that nearly 20% of residents in the jurisdictions of water utilities do not have access to the utilities' service and that 30% do not have access to sanitation services. The assessment found that the population not served by utilities receives water in four different ways in approximately equal proportions: (a) tanker trucks (private SSP); (b) self-supply through springs and streams; (c) administrative boards (community SSP); and (d) other types of SSP, for example, private wells. The SSP provide services to an estimated three million people in urban areas. This figure does not include rural populations that may be served by SSP. Available information and the surveys of this study indicate that SSP do not provide significant sanitation services although they do promote individual systems in many cases.
- (v) For this study, 14 SSP serving 50,000 people in six departments were surveyed. The results indicate the following:
- The SSP are private or communal and have often been in operation for many years. The SSP arose because the government and its agencies could not ensure water supply services to the entire population.
  - Most SSP collect and distribute water without quality control. This poses a public health risk since only half of the water distributed is disinfected and service is often intermittent.
  - Private SSP service is expensive because the companies do not receive financial subsidies. Service tariffs for SSP can run S/. 14 per m<sup>3</sup>, or 15 times more than those of water utilities, which receive government subsidies.
  - SSP bill average S/. 19 per month per household for water, which is equivalent to 5% of the average family income of customers. Both the private and community SSP are financially self-sufficient. Sixty percent of SSP income goes to operating expenses, on average.







- In peri-urban areas consumption is approximately 25 liters per inhabitant per day. Low household income (approximately S/. 360 per month) limits water consumption.
- People living in poverty generally have acceptable water consumption and sanitation practices.
- No SSP providing sanitation services were identified. Although some SSP had promoted latrine systems, they did not finance, operate or maintain them.

The communities served by SSP report that they are satisfied with the service provided by SSP. Ninety percent of respondents said they were satisfied with the quantity of water received, whereas 80% were satisfied with the quality, and more than half believe they pay a fair price for the service. A high level of satisfaction with the services might be explained by the fact that the community members are aware that SSP are the only water service providers available.

The surveys indicate that SSP do not have a well-established relationship with government entities. In general, local authorities believe that the SSP service quality is inadequate although they also acknowledge that these providers serve groups which are not served by the official utilities.



The analysis of the inability of the Peruvian government to incorporate segments traditionally served by SSP reveals a lack of coherence between: (a) political support; (b) legislative instruments and institutions to translate political declarations into better service; and (c) implementation of laws and regulations. Moreover, tariffs are generally low and the **established subsidies are regressive inasmuch as they do not benefit the poorest consumers** who do not receive the service.

A particular concern is that water utilities do not believe they have a mandate to recover operating and investment costs through the tariffs. As a corollary, the tariff policy mandated by the regulator, SUNASS, relies on cross subsidies. Under this system, tariffs for low-income groups cover only a small portion of SPP costs whereas the tariffs charged to the rest of consumers are not high enough to make up the difference.

In summary, the conclusions of this study are as follows:

- **First: Financially weak water utilities have a strong disincentive to carry out additional investments to provide adequate services to the poorest households: expanding the coverage to poor unserved areas would entail a considerable financial loss to the utilities.**

The General Law of Sanitation Services (No. 26338 of 1994) establishes the basic principles for fixing utility tariffs. A key principle is that the tariffs should guarantee the recovery of total operating costs of utilities, as well as their investment costs, under efficient administrative conditions. One of the reasons why costs are not covered is that mayors in the jurisdiction of the utilities control tariff rates. Mayors may find it politically difficult to authorize tariffs that recover the full costs of service.

- **Second: The principle of financial viability through tariffs that cover the full cost of service is not being met, in violation of the law.**

The process of bringing the tariff policy in line with the law will require strong, on-going political support at the highest levels



of government, including the mayors. In addition, an education campaign for consumers and political authorities would be needed to increase support and political buy-in.

- **Third: Although Ministry of Economy and Finance is allocating substantial resources, such growing resources will not necessarily ensure increased coverage or improved service quality.**

Despite the laws, regulations and institutions of the sector, the decisions of the MEF, MVCS, SUNASS and the utilities are not coordinated in a transparent manner, and responsibility for decisions taken is diluted. In particular, the utilities do not feel fully committed to and responsible for achieving service coverage and quality targets and central government entities have not managed to ensure sustainable utility management.

Because the utilities are financially weak, they depend on government funds to finance their investments. In theory, the National Public Investment System (SNIP) analyzes and approves allocation of these funds. Nevertheless, allocated funding and subsidies are not linked in a transparent way to increased coverage. Nor is it clear who should receive subsidies and in what amount, which makes it difficult to monitor, measure and increase the efficient use of public resources in the sector.

- **Fourth: SSP should meet the same water quality standards as the water utilities. Moreover, SSP should meet even higher standard because low quality service poses greater health risks to the socioeconomically disadvantaged groups traditionally served by SSP.**

Private SSP operate without adequate regulation of service quality and tariff structures. Despite the absence of water quality regulation, mainly on the part of the Ministry of Health (MOH) in terms of quality, SSP customers report being quite satisfied with SSP services.

- **Fifth: SSP at least equal the utilities in terms of performance, efficiency and sustainability. In light of the**



***magnitude of unserved population, it is likely that SSP will continue to provide services for many years to come.***

The SSP will co-exist with utilities for many more years. Each has comparative advantages: because of their size, utilities offer economies of scale and potentially better quality services whereas SSP have successfully responded to the unmet demand of the poorest population. Sector officials should promote cooperation between utilities and SSP to avoid market segmentation and to achieve greater synergy in service provision. This would permit authorities to benefit from the comparative advantages of both types of service providers.

## Recommendations

Drawing on the study conclusions, the consultants offer the following recommendations for improving services:

- **First: Apply the spirit of the General Law of Sanitation Services to ensure that the economic regulation of SUNASS will encourage utilities to recover the full cost of efficient services.** This change will create strong financial incentives for utilities to incorporate “SSP segments” that are currently excluded. Allowing utilities to charge the total cost of the service will enable them to counteract the tendency of mayors to gain short-term political advantage by insisting on low, unsustainable tariffs.





- **Second: Create incentives to encourage utilities to give top priority to supplying treated water which SSP would later distribute, and promote coverage of all unserved neighborhoods through low-cost systems (APPJ and/or condominium systems).** To this end, the government should modify the regulatory framework and incentives to obligate utilities to connect all residents within their jurisdiction. Using the output-based aid (OBA)<sup>1</sup> model, utilities would be authorized to raise tariffs and receive financing for investment based on their progress in reaching service coverage targets. Also using the OBA system, utilities/SSP could be encouraged to promote and offer sanitation services. These sanitation systems could be individual (for example, household latrines) or communal (operated by SSP). There are successful cases of community sanitation centers operated by local SSP (for example, the slum sanitation centers in Mumbai, India).
- **Third: Harmonize financial policies with the National Public Investment System (SNIP) that prioritize increased service coverage.** A policy target of increased coverage such as the one announced under the Government's Water for All initiative should guide the development and implementation of water supply projects, starting with the National Investment Fund (FNI), which is expected to become the cornerstone of the public investment program in the sector. The financial policies of the sector must be tied to policies on service coverage and quality targets; otherwise, there is a risk that FNI funds will be used to subsidize those that have always enjoyed sector subsidies: the middle and upper classes that are already connected.
- **Fourth: Regulate SSP in a manner similar to utility regulation.** It cannot be justified, according to the surveys that, the MOH does not adequately monitor water quality and the SUNASS does not control SSP tariffs. Nevertheless, the SUNASS should not necessarily be responsible for regulating SSP given that it does not have



the mandate or the resource to do so. Instead, municipal capacity should be strengthened to regulate SSP services through contracts stipulating specific performance standards. Likewise, efforts should be made to strengthen the capacity of the MOH to monitor and control the quality of water supplied by SSP.

- **Fifth: Establish incentives for utilities to take advantage of the experience gained by SSP in water distribution and customer relations. SSP should be partners of the utilities given that they offer competitive advantages.**

The study suggests **four pilot projects** that would benefit: (i) small communities that currently supply their own water from springs or streams or receive water from inadequate SSP systems; (ii) peri-urban areas that currently receive water from tanker trucks; and (iii) peri-urban areas through an expansion of APPJ and/or condominium systems. These three segments do not have utility services or Sanitation Service Administrative Boards (JASS). In addition, the three investment projects represent a progression from less satisfactory to better quality services.

<sup>1</sup> Output-Based Aid (OBA) is a strategy for using explicit performance-based subsidies to support the delivery of basic services where policy concerns would justify public funding to complement or replace user-fees. OBA involves delegating service delivery to a third-party, typically private firms, but also public utilities, NGOs, and community-based organizations, under contracts that tie disbursement of the public funding to the services or outputs actually delivered.



***The first pilot project would strengthen the public sector to optimize the regulatory system in support of increased coverage of water and sanitation services.***

The evaluation concluded that the regulatory system of the sector is not complying with the General Law of Sanitation Services (No. 26338 of 1994) in terms of recovering investment and operating costs. This has created disincentives for utilities and other service providers to serve slum populations. Instead, a plan should be developed to ensure that regulations are implemented in the spirit of the law.

In addition, the study identified the risk that higher levels of investment financing could perpetuate the subsidies to those who have always enjoyed them: the upper and middle classes. To avoid this risk, a study should be undertaken to create explicit incentives so that public financing be tied to increased service coverage. Specifically, SNIP policies and practices should prioritize expanded service.

Furthermore, the evaluation concluded that service quality regulations lack the momentum and coverage needed to effectively regulate the quality of SSP services. SUNASS certainly does not have the resources to regulate numerous SSP. Therefore, the first project should analyze and propose alternatives to complement and strengthen quality regulation, possibly assigning responsibility to the municipalities where SSP operate. Measures should be analyzed and proposed to strengthen the capacity of the MOH and municipalities to carry out their regulatory function, which they are currently not exercising.

***The second pilot project proposes strengthening and expanding SSP in small communities.*** Under this approach, which has been successfully tested in other Latin American countries, private or community SSP would bid to operate existing systems or build and operate new ones. Projects would be awarded to SSP demanding the lowest subsidies to provide the service. Implementing this type of project would have the advantage of making subsidies explicit while at the same time supporting SSP. This project could also form part of the FNI. The most practical approach would be to use OBA systems to pay SSP for serving low-income populations. The project should not demand a single technology of water supply and sanitation system; rather, it should create incentives for

SSP to offer a variety of technologies. The project could fully or partially subsidize investment in water supply and sanitation services on the condition that customers pay the full cost of system operation and maintenance, thereby achieving system sustainability.

***The third pilot project proposes modernizing the tanker truck services in peri-urban areas by importing late model used trucks.*** This project accepts that tanker trucks are the only way to provide rapid service to low-income slum settlements. At the same time, it acknowledges that the quality of water distributed by tanker trucks is not well regulated. The project proposes replacing a large part of existing tanker trucks with approximately 1,000 good quality imported trucks. Truck owners would receive the replacement trucks after payment in full and after signing a formal agreement to comply with strict quality standards. This would also require the strengthening of the capacity of the MOH to regulate the quality of water of tanker trucks. This type of project could reduce tanker truck water distribution costs by an estimated 25%, in addition to improving water quality. This project is appropriate for concessionary bilateral funding.



***The fourth pilot project proposes replicating APPJ and/or condominial system projects in peri-urban neighborhoods.*** This project would take advantage of the successful experience of reticulated water distribution systems (known as APPJ and/or condominial systems), which are a low-cost alternative for providing services for those without access. Alternative systems would be selected based on their technical and economic feasibility. The project would be appropriate for multilateral or bilateral financing. The pilot projects should encourage SSP to offer a range of water and sanitation systems rather than demand a single technology.



# I. Introduction

The Water and Sanitation Program (WSP), administered by the World Bank, helps countries find sustainable solutions to ensure efficient delivery of the quality water supply and sanitation services the population demands.

The WSP is carrying out a systematic analysis in several countries to identify the role of small-scale providers (SSP) of water and sanitation services to poor populations not served by public and private entities. The study also examines how these operators fit in and respond to sector policies and the organization of the sector in each country.

In 2005, more than six million people in Peru did not have access to satisfactory water services and 11 million did not have adequate sanitation<sup>2</sup>. In 2015, if the targets established in the National Sanitation Plan are met, six million people will still be without an adequate water supply and seven million will lack sanitation service. Low-income families will be the most affected.

Community and/or private initiatives have arisen in the form of SSP to respond to the demand for service of low-income groups. Their existence is largely ignored and is not adequately coordinated by policy makers and service operators. Unfortunately, the lack of effective oversight, particularly of water quality, is evident in a water supply that does not always safeguard public health.

Furthermore, the investments required to provide service to the population without access are significantly higher than sector investments in recent years, a trend that will not be easily reversed. To this end, policies should be introduced to reform the sector, particularly in the area of financing and tariffs. These policies should include adequate incentives to expand service coverage to the low-income population.

The current context suggests that SSP will continue to play an important role in a service delivery to the poorest population for many years to come. It also underscores the urgent need to identify sustainable solutions that are affordable for low-income households.



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<sup>2</sup> Ministry of Housing, Construction and Sanitation. 2006-2015 National Sanitation Plan "Water is Life." March 2006.





## II. Sector Framework

### 1. General characteristics of the country

With a land area of 1.28 million km<sup>2</sup>, Peru has ample, albeit unevenly distributed water resources. The Pacific coastal region has access to only a fraction of those resources but is home to at least 52% of the total population.

In 2005, the per capita Gross Domestic Product (GDP) was US \$ 5,400<sup>3</sup> (purchasing power parity) and 54% of the population lived below the poverty line (67% of the urban population and 46% of the rural population). Economic indicators also reveal marked inequality in income distribution since the 20% of the population with the lowest income receives just 3.2% of total income.

In terms of its political administration, the country is divided into 26 regions, including Metropolitan Lima and the Constitutional Province of Lima-Callao.

Population growth shows a marked tendency toward urbanization.<sup>4</sup> In 1990, 69% of the population lived in urban areas versus 31% in rural areas; 15 years later, the 2005 census reported a population of 27.2 million, with 75% of the population living in urban areas and 25% in rural zones. By 2015, the population is expected to reach 32 million, with an urban population of 78% and a rural population of 22%. The urban population is highly concentrated in the metropolitan area of Lima-Callao, which is home to eight million people, 30% of the total population.

Urban planning is a key aspect of the delivery of water supply and sanitation services. In Peru, and particularly in Lima, despite current legislation and oversight systems, controlling the growth of informal housing has proved very difficult. In Peru and like in many other countries, disorganized growth has driven up the cost of water and sanitation services.

<sup>3</sup> World Bank, World Development Indicators, 2006. April 2006.

<sup>4</sup> The rural population is defined as people living in settlements with fewer than 2,000 inhabitants.

### 2. Sector framework

The sector framework was analyzed to identify the elements considered most relevant for understanding the participation and importance of SPP in the provision of water supply and sanitation services in Peru and to understand why the public utilities have failed to serve the entire population.

#### 2.1 Organization

Table 1 summarizes the organization and institutional responsibilities of the sector, which are detailed below:

##### Central level

At this level, the main entities participating in the management of the sector include the following:

- *Ministry of Housing, Construction and Sanitation (MVCS)* through the Vice-ministry of Construction and Sanitation (VMCS). The ministry oversees water supply and sanitation services throughout the country. It is responsible for formulating, approving, implementing and supervising national policies for these services and for prioritizing projects funded with resources allocated for sector development.
- *Ministry of Economy and Finance (MEF)*. This ministry allocates budget resources for investment and operations (including staff salaries) of all sector agencies.

The operating and investment budgets are prepared and monitored in accordance with macroeconomic goals. These include the budget deficit/surplus and foreign and domestic debt ceilings (more than one year). Budgets are submitted to the Congress for approval.

- *National Supervisory Office of Sanitation Services (SUNASS)*. This agency is responsible for approving the water and sanitation tariffs charged by public service providers in urban areas (utilities, including SEDAPAL) and for overseeing performance of these operators.



- *Ministry of Health (MOH)*. This ministry is responsible for establishing and monitoring quality standards for drinking water and wastewater disposal.

#### Urban area

- *Public utilities*. These agencies are responsible for providing services in urban areas at the municipal or regional level. The utilities, including SEDAPAL (Lima and Callao), are responsible for serving 62% of the total population.

The utilities are subject to:

- ▶ Approval of their tariffs by the SUNASS;
  - ▶ Allocation and control of their operating and investment budgets by the MEF<sup>5</sup>; and
  - ▶ Allocation of investment resources, oftentimes as non-recoverable funds, by the MVCS.
- *Municipalities*. These are responsible for service delivery in towns not served by utilities. Nearly 490 small municipalities (from 2,000 to 30,000 inhabitants) directly provide water and sanitation services to 9% of the population. Municipal authorities define and approve service tariffs. Municipalities are subject to MEF budget controls and the

<sup>5</sup> For example, several central agencies question the judiciousness of SEDAPAL investments, such as the BOT of Chillón or the Northern catch basin.

MVCS prioritizes their access to credit (internal and external) in accordance with the ceilings established by the MEF.

- *Private sector*. The private sector formally participates in conventional concession, management and other contracts. These contracts are signed with the pertinent authorities. Examples of recent contracts include:
  - ▶ Contract with build-operate-transfer BOT<sup>6</sup> to provide bulk water in Chillón (SEDAPAL);
  - ▶ An initial concession contract with the Tumbes utility, signed in 2005; and
  - ▶ Management contracts between specialized operators and municipalities. These contracts are being supported by international technical cooperation agencies, and by the MVCS, in coordination with interested municipalities. The first such contract was signed in April 2006.
- *Neighborhood water and sanitation committees (COVAPS)*. These neighborhood associations define the type of service desired and operate distribution systems, generally using public standpipes, and establish guidelines for service charges and users' contributions to their construction.
- *Small-scale providers (SSP)*. These providers distribute water in tanker trucks, drums, surface networks and similar means. Their prices are not regulated and the water they distribute often lacks adequate quality control.

#### Rural area

- *Water and Sanitation service boards (JASS)*. Community organizations for service delivery in rural areas, where 29% of the population lives.

<sup>6</sup> Build-Operate-Transfer (BOT) is a form of project financing, wherein a private entity receives a franchise from the public sector to finance, design, construct, and operate a facility for a specified period, after which ownership is transferred back to the public sector. During the time that the project proponent operates the facility, it is allowed to charge facility users appropriate tolls, fees, rentals, and charges stated in their contract to enable the project proponent to recover its investment, and operating and maintenance expenses in the project.





In coordination with the community, the JASS define the water supply system, the operational organization of the water supply service (sanitation service needs are resolved through individual solutions, such as septic tanks or latrines) and the fees users pay to install and operate the system.

- Through the National Rural Water Supply and Sanitation Project (PRONASAR), the MVCS provides technical assistance to the JASS and municipalities in service provision and the structuring and financing of investment plans to expand or improve services.

1. The responsibility for resource allocation, which falls mainly on the MEF and MVCS, has not achieved expected results. The absence of effective controls to supervise the planning and quality of investments is a contributing factor. At times, this results in investments with low social, economic and financial profitability, to the detriment of users, especially low-income groups, and affects the financial soundness of service providers.<sup>7</sup>
2. In addition, the decisions of the MEF, MVCS and the SUNASS (utility tariffs) are not coordinated in a transparent manner,

**Table 1.** Institutional framework of sanitation services

Institution		Area	
Activity	Entity responsible	Urban	Rural
• Service provision		Utilities SEDAPAL COVAPS SPP	JASS
• Sector policy • Regulations • Development programs • Investment plans • Technical assistance	MCVS and its offices	Yes Yes Yes Yes Yes	Yes Yes Yes Yes Yes
• Regulation (urban utilities) Tariff and quality	SUNASS	Utilities SEDAPAL	JASS Communities
• Approval of operating and investment costs	MEF and its offices	Utilities SEDAPAL (FONAFE)	JASS
• Formal participation of the private sector o Urban (utilities) o Small urban	PROINVERSIÓN MVCS PRONASAR	(Tumbes) Municipalities	

### 2.1.1 Conclusions on sector organization

In Peru, the sector is highly centralized, particularly with regard to decision making, which directly affects the performance of service providers. Specifically:

for which reason responsibility for the decisions taken has been diluted. In particular, **utilities do not feel fully**

<sup>7</sup> For example, several central agencies question the judiciousness of SEDAPAL investments, such as the BOT of Chillón or the Northern catch basin.



*committed to and responsible for achieving coverage and service quality targets and service provision has not been sustainable.*

3. The lack of effective regulation affects the performance of utilities and the efficiency of their operations. Fines imposed by the SUNASS on the utilities for not meeting targets are ineffective because all public utilities have soft budget constraints that fail to commit their directors to achieving targets stipulated in the approved budgets.

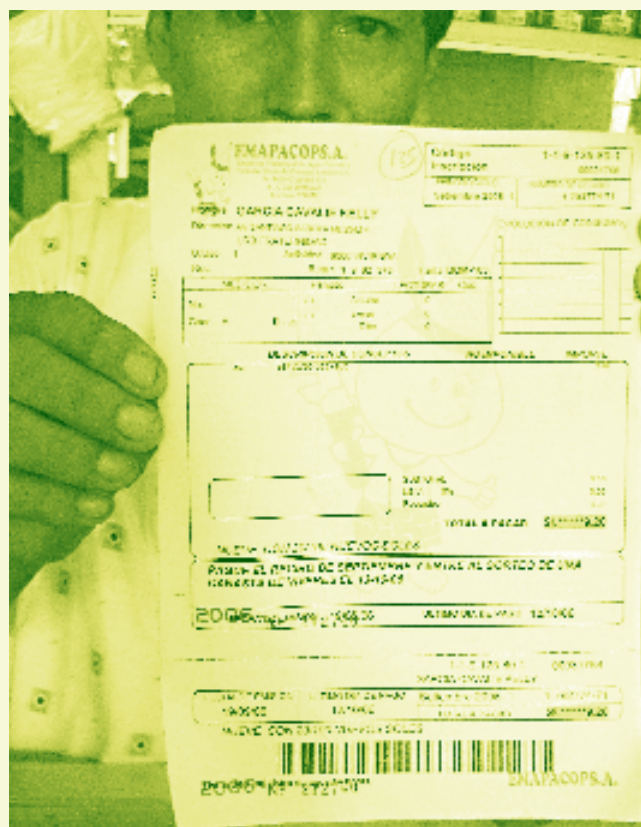
## 2.2 Tariff policy

The tariff policy reveals the limitations utilities face for providing universal, good quality service.<sup>8</sup>

The General Law of Sanitation Services (No. 26338 of 1994) establishes the basic principles for establishing utility tariffs:

- ▶ *Economic efficiency.* Tariffs should reflect the economic cost of service provision and should not transfer to the user the costs of an inefficient operation.
- ▶ *Equity.* All users in the same consumption category and range have the right to equal treatment.
- ▶ *Simplicity.* Tariff calculations should be easy to understand, apply and control.
- ▶ *Financial viability.* Tariffs should guarantee the recovery of total costs and investments of the utility, under efficient administrative conditions.

The SUNASS regulates the tariffs utilities charge, which are based on cross subsidies. Under this system, applied in every Latin American country except Chile, some users, generally domestic, pay a tariff below the cost of supply whereas others, particularly commercial and industrial users, pay a tariff above



the cost of supply.<sup>9</sup> In theory, the price distribution (tariff structure) should result in a median tariff that covers service provision costs.

Key aspects of the tariff structure applied by SUNASS, using SEDAPAL tariffs as a reference, are listed below:

1. Under the cross-subsidy system, consumers who do not receive the service do not benefit from it; consequently, this system discriminates against the poor who are not connected to public services.

<sup>8</sup> Yepes, Guillermo. "Los subsidios cruzados en los servicios de agua potable y saneamiento." IDB. Working Paper. October 2003.

<sup>9</sup> The difference between the tariff charged and the economic cost is the subsidy received (or granted). A subsidy measured in terms of the median tariff is not an adequate indicator unless the tariff reflects the economic cost.



2. The tariff does not distinguish between the types of service provided although the General Law of Services stipulates that it should (Article 84<sup>a</sup> of Regulation No. 26338). Therefore, the tariff is disadvantageous for users who do not have sewerage – generally the poorest population.
3. Even when the median tariff is equal to the economic cost, cross subsidies cause welfare losses (losses for society) for both subsidized (because the subsidy promotes increased consumption) and non-subsidized consumers (because they consume less than they would be willing to pay for if they were charged the real cost). Charging some customers low tariffs also sends the wrong signals to consumers (services are not expensive) and to utilities, which do not have the incentives necessary to adequately serve these consumers, measure their consumption<sup>10</sup> and reduce water losses.
4. Cross subsidies tend to decrease the median tariff because there is a policy and a practical limit to high tariffs for industrial and commercial users. As documented in several Peruvian cities, these consumers have the capacity to use other supply sources.
5. Finally, the basic fee tends to discriminate against the poorest users because it represents a large part of their total payment (thus partially negating the purpose of the cross subsidy). For example, for average consumption in SEDAPAL's social category (average consumption of 9.7 m<sup>3</sup>/month<sup>11</sup>), the minimum charge represents an additional cost of 47% (Annex 1).

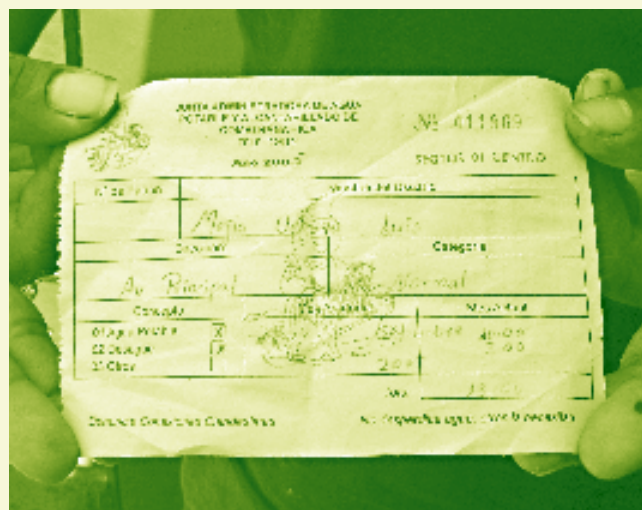
Annex 1 shows the magnitude of SEDAPAL cross subsidies in 2000. Using the median tariff as a reference, 89% of metered customers who consume 62% of the total output are subsidized (or 100% of consumers, using as a reference the

marginal economic cost, estimated at S/. 3.15/m<sup>3</sup>). It should also be noted that:

- The total subsidy tends to increase with consumption and consequently tends to favor higher-income groups (positive income elasticity of demand). Therefore, this subsidy is considered regressive.
- There is no explicit criterion or methodology based on healthy economic and social or financial principles (at the country and at the utility level) to define and grant the subsidy to users entitled to it or to define and bill the surcharge to the rest of consumers (Annex 1, Table 2). Consequently, the resulting tariff structure is arbitrary and difficult to justify.
- Several utilities have found that differential tariffs are conducive to poor management in the commercial system because many consumers benefit from being incorrectly classified.

## 2.2.1 Conclusions on the tariff system

Despite SUNASS efforts to develop a tariff policy appropriate for consumers and utilities, little progress has been made.



<sup>10</sup> In an extreme case, if the tariff for consumption were zero, the utility would have few incentives to measure consumption or reduce losses.

<sup>11</sup> SEDAPAL, Anuario estadístico 2005. Table 1.



In general, tariffs are low and the established subsidies are regressive inasmuch as they do not benefit the poorest consumers who do not receive the service (Annex 1, Table 2).

The lack of cost recovery in service provision weakens efforts of utilities to provide services to the poorest population. Therefore, this pricing structure should be reformulated to benefit both low-income consumers and the utilities.

The problems identified in the current tariff structure are not limited to Peru; other countries with tariff structures and cross subsidies similar to those applied by SUNASS also have been unable to achieve their planned targets.<sup>12</sup>

### 2.3 2006-2015 investment plan

The MVCS<sup>13</sup> has developed an investment plan to achieve coverage targets by 2015.<sup>14</sup>

<sup>12</sup> Yepes, Guillermo. "Los subsidios cruzados en los servicios de agua potable y saneamiento". IDB. Working Paper. October 2003.

<sup>13</sup> Ministry of Housing, Construction and Sanitation. 2006-2015 National Sanitation Plan. "Agua es Vida." March 2006.

<sup>14</sup> This plan was approved by Supreme Decree 007-2006 of March 14, 2006.

Table 2. Coverage Targets for 2015

Service	Coverage %	
	2005	2015
<b>Drinking Water</b>		
• Urban	81	87
• Rural	62	70
• <b>National Average</b>	76	82
<b>Sanitation</b>		
• Urban	68	84
• Rural	30	60
• <b>National Average</b>	57	77
<b>Wastewater treatment</b>		
• SEDAPAL	10	100
• Large utilities	43	100
• Medium-sized utilities	33	100
• Small utilities	6	100
• Other providers, urban	6	100
• <b>Urban Average</b>	22	100

Source: National Sanitation Plan (cited)

The plan also proposes some management targets, including the following: an increase in hours of service (from 17 in 2005 to 23 in 2015); and an increase in micro metering (from 54% to 95%). The plan also provides support for improving maintenance.

The plan calls for a total investment of US\$ 4 billion, which would be distributed as shown in Table 3.

#### 2.3.1 Conclusions on the investment plan

The sector development plan is clearly ambitious as it calls for an annual investment of US\$ 400 million,<sup>15</sup> much higher

<sup>15</sup> The consultants do not believe comparing unit costs of this plan with similar indicators in Latin America is useful because the assumptions of these calculations are not known.





**Table 3. 2006-2015 Investment Plan, US\$ millions**

Area	Drinking water	Sanitation	Wastewater Treatment	Total	%
<b>URBAN</b>	<b>1,238</b>	<b>1,389</b>	<b>1,132</b>	<b>3,759</b>	<b>93</b>
SEDAPAL	577	634	367	1,578	39
Large utilities	321	331	353	1,005	25
Medium-sized utilities	167	200	212	579	14
Small utilities	40	47	47	134	3
Other providers	133	177	153	463	11
<b>RURAL</b>	<b>219</b>	<b>66</b>	<b>-</b>	<b>285</b>	<b>7</b>
<b>National total</b>	<b>1,457</b>	<b>1,455</b>	<b>1,132</b>	<b>4,044</b>	<b>100</b>
Percentage	36	36	28	100	

*Note: Due to rounding off totals may not coincide.*

than that registered for 2000-2005 (approximately US\$ 139 million per year) and for the 1990s (US\$ 240 million annually). Thus, this plan represents a major challenge for all levels. This challenge includes ensuring funding (69% of the planned budget still does not have financing) and streamlining administrative processes, such as contracting and implementation.<sup>16</sup>

In addition, the plan should establish priorities in terms of timetables and components to establish guidelines for decision making in resource allocation in case that funds do not arrive on time or are insufficient.

Although the plan for 2015 is ambitious, it would still mean that approximately six million people would not have access to water supply services and seven million people would not

have sanitation services. Thus, authorities should consider reevaluating the plan to achieve greater coverage and quality of services and should develop strategies to:

1. Strengthen the capacity of the central government and utilities to prioritize investments.
2. Improve the response capacity of utilities, municipalities, COVAPS, JASS and other SSP through technical and financial assistance to enable them to offer better quality services.
3. Develop the capacity of municipalities, or of the utilities if responsibilities are delegated, to effectively monitor the quality of water supplied by SSP.
4. Promote dialogue between operators –utilities and SSP– and the low-income population to identify, in a participatory manner, their demand and to effectively link demand to these customers' willingness and capacity to pay.

<sup>16</sup> For example, SEDAPAL investment fell well short of the 2001-2005 investment plan. In that period, SEDAPAL implemented an average of 72% of the planned investment.





5. Promote the use of low-cost technologies that permit, by definition, reducing investment and operating costs and providing services to more people.

For example, SEDAPAL achieved successful results with condominium water and sanitation systems, which enabled low-income families to reduce their investment costs by 30%. These experiences should be formally evaluated (lessons learned) and disseminated.

6. Identify the tariff gap to develop, in collaboration with SUNASS, a gradual tariff adjustment to enable utilities to operate efficiently and to adequately maintain service infrastructure.



results presented in the 2006-2015 National Sanitation Plan (cited) and information from SUNASS on utilities.

## 2.4 Performance of the sector

The evaluation of the results of service provision provides inputs to assess the capacity of the sector framework (organizations and policies) to respond to sector challenges. This evaluation was based on the operational and coverage

### 2.4.1 Service coverage

Table 4 shows that service access in rural areas and small towns is significantly lower than that in cities served by utilities. In Table 5, a comparison of service coverage in several South American countries demonstrates that Peru generally ranks below the average.

**Table 4. Service Coverage, 2004**

Area	Population Millions	Drinking water		Sanitation	
		P.S.	%	P.S.	%
<b>Urban</b> (Number of providers)	19.6	15.9	81	13.4	68
• SEDAPAL	8.0	7.1	89	6.7	84
• Large utilities (9)	5.4	4.5	82	3.7	48
• Medium-sized utilities (20)	3.0	2.4	79	1.8	61
• Small utilities (16)	0.7	0.4	71	0.3	51
• Small municipalities (490)	2.5	1.5	60	0.8	33
<b>Rural</b> (~75,700 communities)	7.9	4.9	62	2.4	30
<b>Total</b>	27.6	20.8	76	15.8	57

Source: MCVS

P.S. Population served



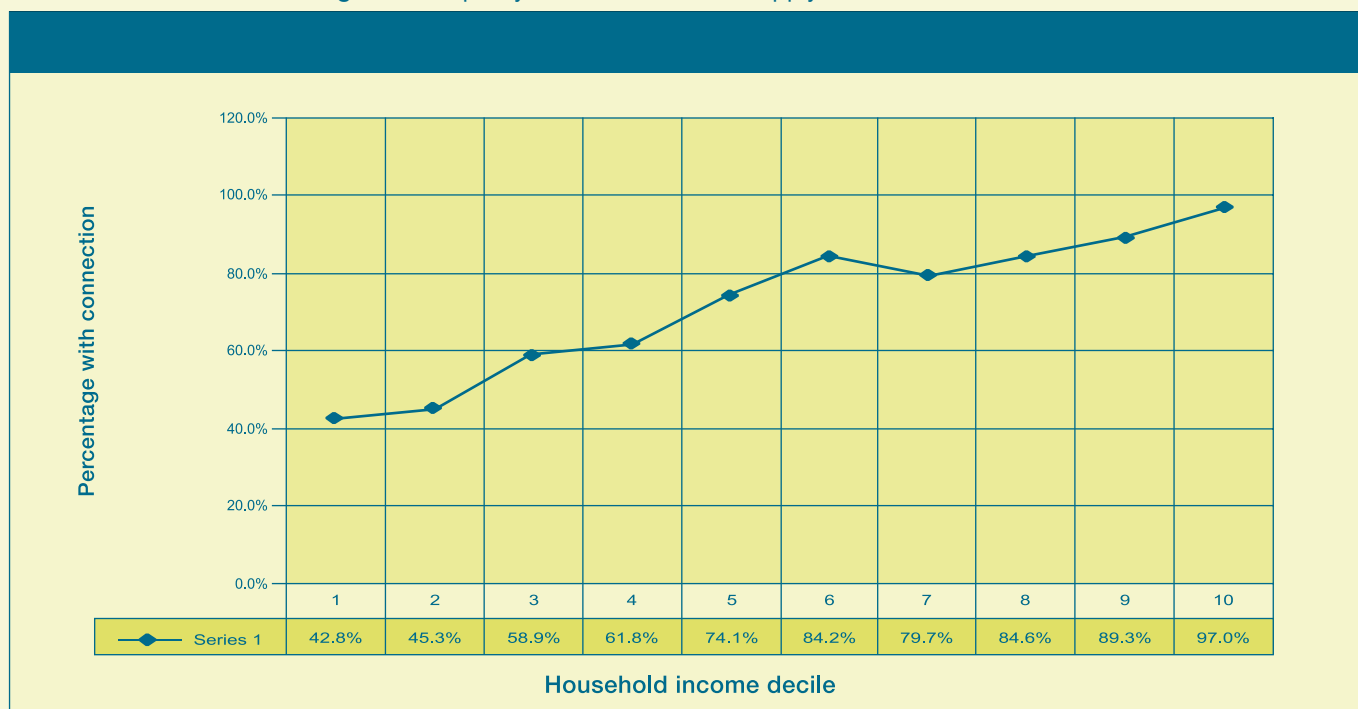
**Table 5. Service Coverage in South America, 2002**

Country	Coverage (%)	
	Drinking water	Sanitation
<b>Peru (2004)</b>	<b>76</b>	<b>57</b>
Bolivia	85	45
Colombia	92	86
Ecuador	86	72
Venezuela	83	68
Chile	95	92

Source: Joint Monitoring Program, August 2006.

The above statistics do not show service coverage of the different economic segments of the population. A study carried out by the Pan American Health Organization (PAHO)<sup>17</sup> reveals a relationship between a connection (within and outside of the dwelling) to a water supply and household income level (Figure 1). While available information on the inequality of service access (household connection) is from 1997, the observations of several non-governmental organizations (NGOs) such as FOVIDA, community associations such as COMAPSA and of the consultants suggest that this situation has not changed appreciably in recent years.

**Figure 1. Inequality in Access to Water Supply Services in Peru 1997**



Source: OPS (cited)

Note: Decile 1 = lowest income; Decil 10 = highest income

Inequality in access to water supply services – 1997

Percentage with household connection

Household income decile

17 PAHO. "Desigualdades en el acceso, uso y gasto con el agua potable en América Latina y el Caribe. Informes Técnicos." February 2001.



The figure confirms the unintentional bias towards investments in urban areas and households with higher incomes. It also underscores the need to explicitly define a strategy for providing services to the population that currently lacks them.

#### 2.4.2 Service quality

The hours-of-service indicator (Table 6) reflects the overall quality of water supply services. While available information refers to the population served by utilities and with connections to the public service network, it is generally agreed that quality service is even more precarious in small municipalities. In addition, this indicator does not reveal that the population without connections, such as communities served by the COVAPS through public standpipes or tanker trucks, receives an even less continuous service. In many cases, water supply is not daily.

**Table 6. Hours of Service, 2005**

Area	Hours of Service	Production LCD	Residual Chlorine %
<b>Urban</b>			
• SEDAPAL	21	265	100
• Large utilities	15	242	98
• Medium-sized utilities	15	269	98
• Small utilities	16	259	98
• Other providers	n/d	n/d	n/d
<b>Rural</b>	n/d	n/d	n/d

Source: SUNASS;  
n/d: no data

The lack of continuous service in all of the country's utilities is indicative of serious operational difficulties given that per capita production is far higher than that of companies in other countries/cities of similar size and development that do provide continuous service.



Despite efforts of utilities, communities and municipalities, quality control of water supplied by tanker trucks and public standpipes is inadequate for ensuring clean water at the delivery point. For example, a study carried out in 2004<sup>18</sup> in Metropolitan Lima found that only 41% of the nearly 800 tanker trucks operating in the area received water from SEDAPAL taps. Seventy percent of the water supplied by trucks did not have acceptable residual chlorine levels. Twenty-eight percent of the municipalities did not perform any quality control procedures.

#### 2.4.3 Operational efficiency

The indicators presented in Table 7 point to the need to improve the productivity of utilities.

**Table 7. Operational Indicators, 2005**

Area	Micro metering %	Water Losses %
SEDAPAL	70	37
Large utilities	41	49
Medium-size utilities	33	50
Small utilities	40	54
<b>Average</b>	47	44

Source: SUNASS

18 FOVIDA. "Queremos Agua Limpia". Assessment of tanker water supply systems in peri-urban areas of Metropolitan Lima. February 2004.



High water losses<sup>19</sup> and low micro metering levels indicate an absence of adequate incentives for the company and its management to achieve a more efficient, quality service, as well as weak regulatory functions.

The low level of metering also explains the lack of continuity of service and the less than optimal management of water resources.

#### 2.4.4 Financial performance

The indicators presented in Table 8 illustrate the financial situation of the utilities. Because of the limited information available, the analysis of financial performance concentrates on SEDAPAL.

**Table 8. Financial Indicators, 2005**

Area	Median tariff water and sanitation S/. per m <sup>3</sup>	Working ratio %	Average accounts receivable, in months
SEDAPAL	1.14	63	4.5
Large utilities	1.31	85	7.4
Medium-sized utilities	0.98	85	4.8
Small utilities	0.90	70	5.1
Average	1.31	69	5.3

Source: SUNASS

Working ratio: the ratio of total operational expenses (excluding depreciation and debt service to total operational income).

19 There are two types of losses: physical –due to leakage in distribution and connection pipes– and non-physical, due to deficiencies in the commercial system (metering, registration of users, water theft, etc.)

The operational indicators presented in the table above suggest the following:

1. The median tariff (S/. 1.41 or US\$ 0.43/m<sup>3</sup>) is less than half that charged by operators in cities of similar size (Bogota, Colombia - US\$ 1.03/m<sup>3</sup>; and Santiago, Chile Aguas Andinas - US\$ 0.89/m<sup>3</sup>).<sup>20</sup>
2. The accounts receivable level is high (in contrast to the utilities cited above –Bogota and Santiago– which have a collection period of three months or less).
3. SEDAPAL's working ratio apparently covers operating costs. Nevertheless, this ratio does not tell whether maintenance is adequate.<sup>21</sup> The high incidence of broken pipes and clogged sanitation networks<sup>22</sup> and the low level



20 ANDERASA. *Las tarifas de agua potable y alcantarillado en América Latina (undated)*.

21 For example, the MVCS (cited) investment plan earmarks US\$ 290 million (24% of total investment planned for expansion) for SEDAPAL to cover rehabilitation costs.

22 Yepes, G. & Klas Ringskog. "Estudio de Oferta y demanda Servicios de agua Potable y Alcantarillado. Lima y Callao." April 2002.





of micro metering indicate that maintenance efforts are insufficient for preserving the productive capacity of service infrastructure.

4. The working ratio and the accounts receivable highlight the utilities' limited capacity to generate counterpart resources and service debt.

The data in Table 8, other SUNASS statistics<sup>23</sup> and information from the Development Plan indicate that financial problems may be more serious in the country's other utilities, where financial indicators are less favorable:

- The debt service of the 45 utilities is approximately US\$ 1.62 billion. If the reimbursable contributions to the former FONAVI are excluded, the debt is reduced to approximately US\$ 1.083 billion, US\$ 601 million of which corresponds to SEDAPAL. These obligations translate into a debt service equivalent to eight years of the operational margin in the case of SEDAPAL and 30 years for the other utilities.<sup>24</sup>
- Of the 45 utilities that reported their working ratio, 32 have a ratio higher than 0.8 and four have a ratio higher than 1 (do not cover operating costs).

In light of the above, it is not surprising that many cities served by these utilities have low coverage rates, non-continuous service and deficient service quality.

#### 2.4.5 Comments on sector performance

Operators have a long road ahead for improving the operation and efficiency of water supply and sanitation services.

Utility financial resources and accountability are important pillars for achieving these improvements. Historically, financial

utility performance has been weak in the sector in Peru and point to the urgent need to reevaluate: a) the organization of the sector and the autonomy and oversight of utilities; b) incentives of the utilities and service providers in general to meet the sector development targets established by the government; c) resource prioritization and allocation; and d) tariff policy.



<sup>23</sup> SUNASS. Annex 2, Ranking de Desempeño de las Empresas Prestadoras.  
<sup>24</sup> MVCS. National Sanitation Plan (cited).





## III. Small-scale Providers

### 1. Introduction

Until the 1980s, with few exceptions (such as Colombia and Ecuador), developing countries had created a national and centralized organizational model for urban water supply and sanitation services. Undoubtedly, this model was preferred because communities and small towns lacked the necessary financial and human resources. It was believed that a central body could overcome these deficiencies. Thus, in Peru in the 1970s, the General Directorate of Sanitation Works (DGOS) of the Ministry of Housing operated and built water supply and sanitation works throughout the country (with the exception of Lima, Arequipa and Trujillo). In 1981, a newly formed state company, the National Water Supply and Sanitation Service (SENAPA), replaced the DGOS. SENAPA built and operated sanitation works until 1990, when its branch offices and 12 operating units were transferred to municipalities. A similar decentralization process took place in most developing countries in Latin America and other regions.

Nevertheless, when they assumed responsibility for the sanitation sector, most municipalities did not have the financial and human resources or the specialized bodies and incentives to effectively fulfill their new mandate. Therefore, many countries looked to private sector participation (PSP) as an alternative model to compensate for some of these deficiencies. Latin America once again led this global process. Nevertheless, some negative experiences with the PSP model raised doubts



about its universal application. The disillusionment of leaders of the water and sanitation sector with the private sector arose from problems occurring, for example, in Cochabamba, Tucumán and later in Buenos Aires. In addition, with the tariff structures imposed on the private sector, the interest of the private sector in providing services to the poor population was called into question.

In response to the state's inability to provide universal service, organizational models developed in the form of small-scale providers (SSP), which incorporated the unquestionable advantages of the private sector with the social concern of providing services to the poorest population. Different types of SSP already enjoyed a long history in large Asian and African cities, where they had always compensated for the deficiencies of municipal administrations unable to provide services to residents. Similarly, in Asunción, aguateros offered adequate and affordable services for the poorest sectors. The development of SSP generated several studies<sup>25</sup> on the issue.



<sup>25</sup> See, for example, "Engaging Local Private Operators in Water Supply and Sanitation Services – Emerging Experiences in Five Countries," World Bank, 2006, with funding from the World Bank-Netherlands Water Project, detailing the experience of Cambodia, Colombia, Paraguay, Philippines and Uganda with the SPP. The WSP has also been at the forefront with SSP studies and applications, such as "Water and Sanitation Services for the Urban Poor" – Small-scale Providers: Typology and Profiles." WSP, Dec 1998, Suzanne Snell.



From this perspective, and in an effort to seek a greater role for SSP, this study analyzes SSP characteristics and these operators' potential contribution to achieving the Millennium Development Goals for 2015 in Peru in terms of coverage and quality of water supply and sanitation services.

## 2. Characteristics and reach of SSP

During a rapid and uncontrolled urbanization process, the most recent low-income inhabitants will most likely settle in peri-urban areas. In 1940, Peru was a predominately rural country, with only about a third of its population living in urban areas. Forty years later, in 1981, the proportions had reversed and in 2005, 75% of the population was classified as urban and 25% as rural. Both the unrelenting urbanization process and urban migration affect efforts to provide water supply and sanitation services to the entire population. This observation is even more important considering that service unit costs

decrease with greater population density at the same time that the risk of waterborne disease epidemics increases with the overcrowding characteristic of low-income neighborhoods. These circumstances make a priority of providing services to residents of poor peri-urban areas.

## 3. Water supply market

The 2005-2015 National Plan for the Sanitation Sector estimates that 6.7 million of the country's 27.5 million people, or 24%, lack water supply services from official providers, including service utilities of different sizes and other providers, such as municipal or community operators. An even larger population does not have access to the sanitation services provided by utilities or other providers. An estimated 11.8 million, or 43% of the total population, do not have sanitation service. Table 9 details the lack of these services in Peru.

**Table 9. Population Lacking Water and Sanitation Services (2004)**

Service Provider	Total Population	Population without Water Supply Services		Population without Sanitation Services	
	Millions	Millions	%	Millions	%
Urban	19.6	3.7	19	6.3	32
SEDAPAL (Lima)	8.0	0.9	11	1.3	16
Large utilities	5.4	0.9	18	1.7	32
Medium-sized utilities	3.0	0.6	21	1.2	39
Small utilities	0.7	0.3	29	0.4	49
Other providers <sup>1/</sup>	2.5	1.0	40	1.7	67
Rural (fewer than 2,000 inhabitants)	7.9	3.0	38	5.5	70
Total population without service	27.5	6.7	24	11.8	43

Source: 2005-2015, *National Plan for the Sanitation Sub-sector*, Ministry of Housing, Construction and Sanitation.

Notes: <sup>1/</sup> Includes 490 localities with municipal or community service providers.



As noted, the lack of water supply services is inversely related to the size of the provider in urban areas. Thus, just 11% of the population served by SEDAPAL lack services whereas 40% of the population in the jurisdictions of smaller municipal or community providers do not have access to services. Likewise, the percentage of the population without sanitation services ranges from a minimum of 16% with SEDAPAL to 67% with municipal or community providers. For both types of service, lack of access in rural areas approaches the maximum percentage for urban areas: 38% of rural inhabitants do not have water services and 70% have no sanitation services.

In theory, the inability of utilities and municipal or community providers to provide water and sanitation services to the entire population within their jurisdictions has created a market for SSP. The SSP compete with utilities in larger communities as well as with different forms of self-supply by consumers

in small communities. With a view to understanding the different forms of supplying water to the unserved population in the country, the MVCS carried out a rapid assessment of unserved populations in the jurisdictions of utilities in October 2006.

The MVCS survey (Table 10) shows that 20% of residents living within the jurisdiction of utilities do not have access to a water supply and 30% do not have sanitation service. Of the 20% without water supply service from the utility, 25% receive water from tanker trucks, 19% from springs, 12% from administrative boards of different types, 20% from neighbors and 24% from unspecified systems. Assuming that half of those receiving water from their neighbors (or 50% of 20%) receive water that comes from self-supply and the other half (50% of 20%) are supplied by administrative boards, it can be concluded that the population without access to utility services receives water in four different ways, in roughly equal proportions:

- From tanker trucks, generally operated by private SSP (25%);
- From springs, usually through self-supply (19%+10% = 29%);
- From administrative boards, which are community SSP (12%+10%=22%); and
- From other types of SSP, such as distributors of private well water (24%).







The 14 surveys carried out as part of this study confirm the hypothesis that the unserved population receives water from the sources in these approximate proportions. Households supplied through different types of SSP report that if they did not have service access from this operator, they would resort to self-supplying from springs, streams or brooks, or would receive services from other SSP. Assuming that the proportions of the different types of service are similar in urban populations served by providers other than utilities, SSP served an estimated three million urban dwellers (Table 10).

This is only a rough estimate because the population served by SSP in rural areas is not known. No SSP are known to provide sanitation services in either rural or urban areas.

In an effort to identify the characteristics and reach of SSP, different types of SSP were surveyed during September-October 2006. The 14 SSP are located in six departments: Lima (4), Ica (3), Junin (1), Cajamarca (3), Ucayali (1) and Loreto (2). The information was collected from four zones with different geographic, weather and socio-cultural conditions. Table 11 and Annex 2 provide more details on these communities and their respective SSP.

Responses to the 14 surveys were classified following the sequence of the questionnaire presented in Annex 3. The survey was designed to evaluate the legal/institutional, technical, economic, financial and social viability of SSP services. The follow aspects were considered:

- ▶ Legal
- ▶ Technical
- ▶ Market
- ▶ Financial; and
- ▶ Consumer

**Table 10.** Type of Service Provided to the Unserved Population, 2006 (millions of people)

Type of SSP	Unserved urban	Unserved rural community	Unserved, dispersed rural	Total population
Tanker trucks	1.0	0	0	1.0
Boards (JASS)	0.9	0	0	0.9
Other SSP	0.9	0	0	0.9
Self-supply	0.9	1.0	2.0	3.9
Total	3.7	1.0	2.0	6.7

Source: MVCS rapid assessment, October 2006, and consultants' estimates.



**Table 11.** Alternative Service for the Population not Served by Utilities (2006)

Utility	Total	Does not receive from the utility		Proportion of alternative water services				
		Water services	Sanitation services	Tanker truck	Spring	Board	Neighbors	Others
Sedachimbote, Chimbote	387	41	87	0.60	0.10	0.15	0.09	0.06
EPSASA, Ayacucho	189	47	82	0.50	0.32		0.18	
EMAPA Huacho	102	12	16	0.45		0.45	0.10	
Moyobamba Utility	61	10	24		0.30		0.30	0.40
Tacna Utility	286	17	17	1.00				
EMAPACOP of Coronel Portillo	231	105	119	0.10	0.20		0.15	0.55
EMAPAT of Tambopata	49	9	32	0.09	0.15	0.39	0.37	
EMSAPUNO of Puno	173	48	55		0.90		0.10	
Ilo Utility	68	5	20	1.00				
SEDALORETO Utility	423	123	167	0.01	0.08		0.77	0.14
Huancavelica Utility	45	21	21			1.00		
SEDALIB Utility of La Libertad	871	205	293	0.50	0.15	0.03	0.15	0.17
Cajamarca Utility	118	10	15	0.04	0.10	0.15	0.71	
SEDAPAR Utility of Arequipa	1,027	145	222	0.35		0.10		0.55
SEMAPACH of Chincha	143	11	46	0.60			0.20	0.20
Central Jungle Utility	116	36	56	0.25	0.25	0.25	0.25	
SEDAM Utility of Huancayo	401	93	116	0.01	0.48	0.50	0.01	
Central Highland Utility of Tarma	60	15	15		0.75	0.06		0.19
Mantaro Utility	18	1	3		0.60		0.40	
EMUSAP Utility of Abancay	48	15	19		0.28	0.28	0.34	0.10
Moquegua Utility	50	41	9	0.06			0.29	0.65
EMAPAB Utility of Bagua	33	26	24			0.40		0.60
Total sample of 22 utilities	4,8991	1,0362	1,458	0.25	0.19	0.12	0.20	0.24

Source: Survey carried out by the Ministry of Housing in October 2006. 1/ represents approximately 55% of the population not served by utilities. 2/ represents approximately 55% of the population not receiving water supply services administered by utilities.





**Table 12.** Details of the 14 SSP Surveyed

Region and Location <i>Gran total</i>	Location	Population Served (inhabitants)	Socioeconomic Class	Type of provider	SSP
<b>Metropolitan Lima</b>					
San Bartolo	Urban	700	Middle class	Tanker trucks	Company
Lurín	Peri-urban	10,500	Lower middle class	Tanker trucks	Association
Ventanilla	Peri-urban	4,000	Lower class	Tanker trucks	Association
San Juan de Lurigancho	Peri-urban	3,250	Lower class	Tanker trucks	Association
Subtotal Metropolitan Lima		18,450			
<b>Coast</b>					
La Comatrana - Ica	Peri-urban	6,500	Lower middle class	Water supply system with household connections	Administrative board
La Angostura - Ica	Urban	2,000	Upper class	Water supply system with household connections	Association
El Ingenio - Ica	Rural	4,300	Lower middle class	Water supply system with household connections	Association
Subtotal Coast		12,800			
<b>Highlands</b>					
Saños - Junín	Peri-urban	2,826	Lower middle class	Water supply system with household connections	Administrative board
Progreso La Toma - Cajamarca	Rural	294	Lower class	Water supply system with household connections	Administrative board
La Victoria - Cajamarca	Rural	1,260	Lower class	Water supply system with household connections	Administrative board
Subtotal Highlands		4,380			
<b>Jungle</b>					
Pucallpa - Ucayali	Peri-urban	500	Lower middle class	Water supply system with household connections	Private
Jaén - Cajamarca	Urban	12,560	Lower middle class	Water supply system with household connections	Association
Tamshiyacu - Loreto	Small town	600	Lower middle class	Water supply system with household connections	Private
Nauta - Loreto	Small town	650	Lower middle class	Water supply system with household connections	Company
Subtotal Jungle		14,310			
<b>Grand Total</b>		<b>49,940</b>			



### Legal aspects of the SSP surveyed

Ownership of SSP is divided between private companies (43%) and community property (57%). The latter are further divided into administrative boards for sanitation services (JASS) and other types of associations. An SSP can be either private or public. Nevertheless, SSP more closely resemble private entities. It should be noted that no private SSP receive subsidies for their operating costs and only two of the public companies depend on financial subsidies for investments.

Their independence from governmental agencies is evident in the frequent lack of contracts and official licenses to provide the service. Only two-thirds (64%) have a license or formal agreement granting them the right to supply water whereas the rest operate without any type of license.

In addition, 57% report that the quality of the water they distribute is monitored whereas 43% state that there is no quality regulation. The MOH says it does not have the resources to satisfactorily monitor and regulate water quality. Therefore, the majority, if not all, SSP operate without rigorous water quality control.

Drawing on the data of the 14 surveys, the absence of water quality control is particularly worrisome considering that only

29% of the systems have a treatment system and only half of SSP (50%) report disinfecting the water they distribute.

With respect to tariff regulation, 86% of the SSP report that they are not regulated, whereas just 14% report operating under a regulated tariff system. Members of community SSP establish the tariff structure.

Despite their informal establishment or unregulated operation, SSP have been operating for an average of 16 years and many have been working for decades. Several SSP enjoy greater stability than many public systems that formed part of the SENAPA in the 1980s, and which later became utilities or other types of providers.

### Technical aspects

In keeping with the independence of SSP, survey responses demonstrate that SSP generally depend on their own water sources: 71% depend on private sources and 29% on public sources. In two cases (14%), the water distributed originates from utility systems. Sixty-four percent of SSP use groundwater sources.

Only one SSP uses water meters to measure water consumption. However, distribution by tanker truck or street vendor uses an implicit measurement system because water is paid for upon receipt, which restricts household consumption levels in the same way a meter does. The SSP provide services for an average of 14 hours per day, with a range between eight and 24 hours.

Half of the households use latrines and 43% live near sewerage networks. Only a fifth of SSP surveyed treat collected wastewater, which does not mean that they treat a fifth of the volume of the wastewater collected. The low levels of wastewater collection pose a potential threat to public health since service is intermittent, which constitutes a contamination risk through infiltration of the water table into the distribution system in cases of a piped network. No case was found of an SSP operating sanitation systems, and none had constructed such a system.





The SSP are apparently quite self-sufficient when confronting operational problems. Seventy-one percent of SSP reported having their own operators or technicians that knew how to repair technical problems whereas 14% said they had difficulty finding qualified technicians when operational problems occurred. Seventy-one percent of SSP reported that their maintenance activities were limited to cleaning their tanks and equipment as a preventative measure. The importance of preventive maintenance was more evident with the tanker trucks because operators had no source of income when their vehicles were out of service due to mechanical problems.

A key consideration for selecting technical alternatives is the cost of the different types of service because of their impact on tariff structures. The relevant cost is the so-called economic cost, which covers two categories: operation and maintenance (operating costs) and investment costs. The annualized cost of investment can be calculated assuming a useful life and a capital cost (opportunity cost). Table 13 lists the respective cost calculations.



Costs of the APPJ system come from the report on water services in peri-urban zones of Metropolitan Lima, published by SEDAPAL in March 2002.

**Table 13. Cost of Alternative Systems in Peri-urban Areas** (costs in soles per m<sup>3</sup>)

Service Type	Household Connection	Consumption, LCD	Costs		
			O & M	Capital	Total
Tanker truck	No	25	6.40	0.10	6.50
APPJ system	No	25	0.70	1.80	2.50
Condominial	Si	50	0.70	3.00	3.70
Conventional	Si	50	0.70	3.70	4.40

Consumption levels are based on surveys of SSP- tanker trucks, and on estimates of the study of supply and demand for water and sanitation services of Lima and Callao carried out by Guillermo Yepes and Klas Ringskog in April 2002 for APPJ systems, and consultants' estimates. Operation and maintenance costs (S/0.70/m<sup>3</sup>) come from the SEDAPAL system, which provides water supply services to the Siglo XXI settlement in San Juan de Lurigancho in Lima. Estimates were made for the three APPJ, condominial and conventional systems, to make data comparable.

Tanker truck costs come from the actual budget of San Bartolo, adapted to conditions of Ventanilla, with tariff regulation and a shorter distance covered.

Condominial/conventional system costs were provided by SEDAPAL. The conventional systems correspond to SEDAPAL standard system designs whereas the condominial



systems apply designs with lower consumption, established within the plots and which therefore use shallower, shorter ditches, resulting in lower overall investment costs.

Capital costs were annualized over 15 years with a capital recovery factor of 0.13, corresponding to an annual discount rate of 10%.

Note that economic costs do not necessarily correspond to the tariffs charged in the case of the APPJ, condominial and SEDAPAL conventional systems. For example, in 2005, SEDAPAL charged a social tariff of S/. 0.97/m<sup>3</sup> in shantytowns for consumption through household connections. In contrast, some tanker truckers charge customers S/. 10/m<sup>3</sup>. Comparing the costs of the tanker truck with the SEDAPAL social tariff (subsidized), the tariff ratio is 10:1. However, the ratio in terms of economic costs of SEDAPAL service is much lower simply because the economic costs of any reticulated system are high when consumption is low, such as in shantytowns.

#### Market aspects

The household income of SSP customers ranges from S/. 200 to S/. 500 monthly, with an average of S/. 360 per month. This household income level can be compared with the current monthly minimum wage, which is S/. 480.

The financial limitations of households are demonstrated by the fact that 67% of the systems do not offer 24-hour service

because customers are not willing to pay the additional costs to enjoy this service.

On average, 56% of household heads have completed primary school and 44% have a secondary school education. An estimated 77% of consumers have received some type of sanitary education; as a result, they practice acceptable hygiene habits in terms of water consumption and excreta disposal.

Neighborhoods were an average of 50 years old and 77% of consumers hold titles to their property.

Households buy water from SSP because the public sector does not provide the service. The SSP were formed because there is no utility (54% of respondents); because the utility cannot provide the service (23%); or because consumers consider the SSP tariff more attractive (15%). Thus, in most cases, the public sector has not been able to satisfy the demand to which SSP are responding. In just one case, the utility and the SSP share service provision.

The low per capita consumption of the communities surveyed is noteworthy. Table 14 shows the consumption levels of the systems where there is a direct or an indirect measurement, as in the case of all distribution systems where payment is made on delivery. Payment on delivery restricts the level of consumption in the same way having a meter does.

**Table 14. Representative Consumption of SSP Measured Systems**

Location and year	Per capita consumption, per day	Consumption per household, m <sup>3</sup> per month
Nauta, 2006	20	3.0
San Bartolo, 2006	56	8.4
San Juan de Lurigancho, 2006	23	3.5
Tamshiyacu, 2006	22	3.3
Ventanilla, 2006	27	4.0
Average survey 2006	25	3.8
10% lower than SEDAPAL	19	2.8
20% lower than SEDAPAL	31	4.6

Sources: Surveys of this study, 2006  
 "Estudio de oferta y demanda. Servicios de agua potable y alcantarillado". Lima-Callao, April 2002. Guillermo Yepes and Klas Ringskog. April 2002, for the SEDAPAL.





Low consumption levels are typical of low-income households that do not have sufficient funds to invest in sanitary fixtures and that are restricted in their consumption by limited household budgets. Low consumption has implications for system design and expansion of production.

#### Financial and administrative aspects

Given the low-income level, it is not surprising that consumers pay close attention to tariffs. Monthly charges vary enormously, from S/. 1 per month per household for an unmeasured service to S/. 55 per month. On average, households pay S/. 19 per month, equivalent to 5% of reported household income. Tariffs can reach levels as high as S/. 14 per m<sup>3</sup>, but monthly charges are low since consumption levels are very low.

In only one case is water consumption measured, although all tanker truck service is measured because consumers pay for their drum (200 liters) on delivery. Thirty-eight percent of SSP offer up to three months of credit, but most do not offer any credit. After three months of non-payment, the service is discontinued.

The SSP are generally small, with an average of 12 employees, and a range of between one and 64 employees. The largest

SSP are tanker truck associations. On average, the SSP surveyed earned S/6,000 per month, but revenue varied widely, from S/.50 for a rural system to S/17,800 for a system serving 14,000 people.

All SSP generate a surplus, which represent the earnings of SSP personnel or owners. Working ratios<sup>26</sup> range from 0.12 to 1.00, the minimum and maximum for small systems. The working ratio for larger, more representative systems is approximately 0.60. This level is below that of utilities, which is approximately 0.80.

#### Consumer aspects

If customers did not receive services from SSP, they would obtain water from other sources. The most frequent alternative source would be other SSP (38% of respondents), followed by self-supply from springs, private wells or streams (31%), the municipal service or the water board (23%). Except in one case, consumers would use service from a utility.

Consumers are generally satisfied with the quality of the water service provided by their SSP. Ninety-two percent said they were satisfied with water quantity, 83% with water quality and 55% believe that the tariff is fair in relation to service quality.

With respect to household sanitary facilities (in the case of consumers with pressurized, piped water), 100% have a shower and sink, 88% a toilet and 62% a latrine. In cases where customers do not have pressurized water, sanitation facilities consist of a latrine known as a silo.

<sup>26</sup> The financial working ratio is defined as the ratio between revenue collected and operating and maintenance costs, without considering fixed asset depreciation.



## IV. Main Conclusions

The policy analysis shows the water and sanitation sector in Peru that is highly centralized, particularly with regards to decision making, which directly affects the performance of companies or utilities that provide the service. The fact that tariffs do not reflect the real cost of services has created a dependence on investment resources from the national budget. Responsibility for resource allocation falls mainly on the MEF and the MVCS. The absence of effective controls to supervise planning and the quality of investments at times leads to investments with low social, economic and financial profitability, to the detriment of consumers, particularly the poor. This also affects the financial soundness of utilities.

The utilities do not believe they can recover operating and investment costs through tariffs. The problem is compounded by the SUNASS cross-subsidy tariff policy, in which tariffs for the lowest-income segments do not cover more than a small portion of costs and tariffs for high-income groups do not make up the difference for the subsidy granted.

***First conclusion: The inevitable result of the tariff policy is that financially weak water utilities have a strong disincentive to carry out additional investments to provide adequate services to the poorest households: expanding services to those households would represent a considerable financial loss to the utilities.***

The General Law of Sanitation Services (No. 26338 of 1994) establishes basic guidelines for setting utility tariffs. A key guideline is that the tariffs must guarantee the recovery of total costs and expenses incurred by the providers, as well as their investments, under efficient administrative conditions. This problem is perpetuated in part because mayors control tariffs in the jurisdictions of municipal utilities. Therefore, it is difficult for government officials and their constituents to implement tariffs in the spirit of the law.

***Second conclusion: The principle of financial viability through recovering the full costs of service is not being met, in violation of the law.***

The process of bringing the tariff policy in line with the law will require strong, on-going political support at the highest levels of government, including the mayors. In addition, an education campaign for consumers and political authorities would be needed to increase support and political buy-in.

***Third conclusion: Although the Ministry of Economy and Finance is allocating substantial, potentially increasing resources given the country's favorable macroeconomic growth, it will not be easy to ensure increased coverage or improved service quality.***





Despite adequate laws, regulations and institutions of the sector, the coordination between the MEF, MVCSS, SUNASS and the utilities is not clear, for which reason responsibility for the decisions taken has been diluted. In particular, the utilities do not feel fully committed to and responsible for achieving coverage and service quality targets and any improvements of utility management have not been sustainable.

Given their financial weakness, the utilities depend on government resources to finance their investments. In theory, the SNIP is responsible for analyzing and approving these fund allocations. Nevertheless, the funds and subsidies allocated are not transparently linked to quantitative objectives of increased coverage, nor is it clear who should receive subsidies and in what amount. This makes it difficult to monitor and raise the efficiency of the use of public resources in the sector.

***Fourth conclusion: The SSP should meet the same water quality standards as the water utilities. Moreover, the regulation of water quality and consumption practices should be even more rigorous than for general population, because low quality service poses greater health risks to the socioeconomically disadvantaged groups traditionally served by SSP.***

Private SSP operate without adequate regulation of their service quality and tariffs. Despite this lack of regulation, which for water quality is the responsibility of the MOH, SSP customers are satisfied with SSP services.

***Fifth conclusion: The SSP at least equal the utilities in terms of performance, efficiency and sustainability. In light of the large unmet demand for services, it is likely that SSP will continue to provide services for many years to come.***

In Peru, SSP may be private (such as tanker truck service) or communal (such as JASS). Both have arisen from the inability of the Peruvian government and its agencies to provide services to certain population segments.

Many SSP have long played a key socioeconomic role but without the due integration with other entities of the sector and without enjoying the same government financial support as the utilities and many JASS.

***Sixth conclusion: The utilities and SSP should cooperate with one another rather than segment the markets by working separately. In this way, the comparative advantages of both types of service could be exploited.***

The utilities and SSP will co-exist for many years to come. Both possess comparative advantages: because of their size, utilities offer economies of scale and potentially better quality services whereas SSP have successfully responded to the unmet demand of the lowest-income sectors.





## V. Policy Recommendations

### Introduction

Through its Water For All program, the Peruvian government has declared its intention to work to increase the coverage and quality of water supply and sanitation services. The recommendations below seek to suggest how policies and practices of the sector could be improved, in support of government policies. It is useful to recall the different dimensions of sector policies:

- *Political declarations*, expressions of political support in favor of a specific course of action;
- *Policy instrumentation*. Exemplified through the enactment of laws with their due regulations and regulatory framework;
- *Policy implementation*. Effective application of the policies, laws and standards adopted; and
- *Policy results*. The measurable impact of policy application over the years. Indicators should continually measure results, for example, the number of individuals connected to water supply and sewerage systems, and the quality, efficiency and sustainability of services. Although it is useful to measure indicators such as the level of investments reached or the installations built, these indicators measure only the means to achieve the expected benefits, not the benefits themselves. Likewise, the level of water production and consumption do not measure objectives of improved public health or well-being.

This sequential policy analysis is essential for understanding why policies may not produce the promised or expected benefits. For example, political declarations may be nothing more than empty statements if the instruments and institutions do not exist to transform declarations into actions. Laws and regulations may be adopted without the political support needed to implement them. A similar case is differentiating between what the government promises and what it actually delivers. This has relevance for analyzing sector policies in Peru. The general observation is that Peru has managed to create the necessary instruments to reform the water and sanitation sector but the government has failed to implement them effectively.

***First recommendation: Implement tariff and regulatory policies to enable and create incentives for the utilities to recover total costs of services.***

***Comment:*** The recommendation is not innovative since this principle has been the cornerstone of the water supply and sanitation sector in other countries, such as Chile since 1990. Nevertheless, in Peru, modifying tariff policies and regulations would require eliminating many biases and practices. The benefits of obligating utilities to charge the total cost of service include the following:

- Utilities would have financial incentives for incorporating the unserved because the additional consumption would be sold at total cost, and would provide an appropriate return on the capital invested;
- If the principle were established that low-income segments currently served by SSP would have to pay the total cost of service (estimated at S/. 3.7/m<sup>3</sup> in Lima for condominial service, or S/. 2.5/m<sup>3</sup> for AAPJ service), SSP customers would receive better service at a price below what they currently pay to their respective SSP;
- The financial situation of the utilities would improve mainly because of the pressure that would be created to establish similar tariffs for the other population groups, which today are being subsidized, to the detriment of service efficiency and financial sustainability. The question is: Why do higher-income groups pay lower tariffs than slum dwellers?
- Forcing the utilities to charge the full cost of the service would eliminate the problem of mayors charging low tariffs for short-term political gain;
- Forcing utilities to charge the full cost of service would be likely to reduce the level of unaccounted-for water, thereby benefiting the financial situation of utilities. This is because the lost benefit of each uncharged cubic meter would increase substantially with cost-covering tariffs which would stimulate utilities to convert lost cubic meters into paying ones.





***Second recommendation: Create incentives for utilities to prioritize supplying service to the unserved and cover all unserved neighborhoods with low-cost systems (APPJ and/or condominial systems) as soon as possible.***

**Comment:** Currently, utility executives often focus first on capturing, treating and distributing water, and only second on connecting households. This focus makes utilities lose sight of the goal of connecting the entire population. The proof is that after many decades, populations served by SSP are still without access to utility services. The government should modify the regulatory framework and incentives to oblige utilities to connect the entire population within their jurisdictions. Incentives would be created mainly through the proposed adjustment of the tariff structure.

Connecting the entire population within the jurisdiction of the utilities is feasible given that: (a) the necessary increase in terms of drinking water is minimal given the low levels of consumption of the unconnected population. In a city with a current coverage rate of 90%, incorporating unconnected households would increase total consumption by less than 3%. Incorporating the unconnected 20% (if coverage is just 80%) would require a production increase of 6% or less; and (b) having an established SSP would facilitate service provision to unconnected consumers since the utility could subcontract the SSP to distribute water in unserved neighborhoods.

***Third recommendation: Harmonize financial policies with the National Public Investment System (SNIP) to ensure that water supply projects are prioritized in terms of increasing the connected population.***

**Comment:** Applying output based aid would facilitate efforts to ensure universal service connection. Under this system, utilities would receive authorization for tariff increases and funding for works based on the progress made in connecting households.

To meet this objective, financial policies would have to be developed to focus the use of resources of the National

Investment Fund (FNI) to connecting the entire population. If sector financial policies are not tied to service coverage and quality targets, FNI funds run the risk of being used to subsidize those who have always enjoyed subsidies: the middle and upper classes that are already connected.

***Fourth recommendation: SSP should be regulated, at least in terms of tariffs and water quality, in a manner similar to utilities. As a corollary, SSP within the jurisdictions of utilities should be obliged to obtain water from utilities, if the latter can supply it, thereby ensuring water quality control.***

**Comment:** The lack of monitoring or regulation of SSP cannot be justified, either by the MOH in terms of water quality, or by the SUNASS in terms of tariffs. The arguments that resources are unavailable for implementing this regulatory function are not valid since the absence of controls threatens the health of a large part of the Peruvian population. Once the regulatory system is in place –most likely under the responsibility of municipalities and the MOH rather than SUNASS– SSP should be given financial and technical assistance to enable them to meet water quality standards. According to the surveys, none of the private SSP has access to credit, most likely because of the onerous procedures involved for SSP, whose market does not offer guarantees for continued existence during the credit period.

***Fifth recommendation: To take advantage of the experience acquired by SSP in water distribution and customer relations, SSP and the utilities should work together as partners to support the unserved population.***





## VI. Pre-identified priority projects

The growth of the Peruvian economy will allow higher investments in the water supply and sanitation sector. This economic growth gives the MEF greater freedom to select bilateral or multilateral agencies based on what they can contribute to resolving the problem of the population without service. This study proposes four pilot projects appropriate for external financing. However, these projects could be implemented just as well with national funds, without the need for outside aid.

Any project proposed should seek to improve service to the market traditionally served by SSP or that could be served by SSP. This involves classifying projects by the types of service that would have to be provided to the 6.7 million Peruvians who still do not have water service. At the same time, there is a potential market for SSP, as Table 15 indicates. The SSP could potentially serve nearly five million people—at least in the intermediate term.

policy adjustments will be more feasible if they are combined with investment projects. To this end, the consultants have proposed a pilot project to improve the sector's regulatory framework as well as three other projects that combine investments with policy adjustments and strengthening, as described below.

***First pilot project: Strengthening the public sector to optimize the regulatory system in support of increased coverage of water and sanitation services.***

**Comment:** The evaluation found that the regulatory system does not comply with the spirit of General Law of Sanitation Services (No. 26338 of 1994) in terms of the recovery of investment and operating costs. Incompliance with this law has generated disincentives for utilities and other providers to serve the unserved. Thus, a study of the economic regulation of the water and sanitation sector is proposed to produce a

**Table 15. Potential SSP Market (Millions of people)**

Potential SSP Market Segment	Urban, Unserved	Rural Community, Unserved	Rural, Dispersed, Unserved	Total SSP Market
Tanker truck	1.0	0	0	1.0
Boards (JASS)	0.9	0	0	0.9
Other SSP	0.9	0	0	0.9
Self-supply	0.9	1.0	2.0	1.9
Total	3.7	1.0	2.0	4.7

In addition, it has been demonstrated that without policy adjustments in the sector, neither the utilities nor SSP will have incentives to serve the population without services, nor will they be able to operate sustainable systems. This evaluation found that the systemic problems of the sector are largely the result of the inconsistent application of existing laws and regulations rather than a lack of knowledge on what needs to be done. Achieving the recommended sector

plan to develop and apply regulations in accordance with the spirit of the law.

The evaluation identified the risk that greater financing of investments in the sector could simply perpetuate the subsidies for those who have always enjoyed them: the upper and middle classes. To avoid this risk, a separate study could be carried out to identify specific incentives to link public



financing with increased service coverage. Specifically, the study could analyze and propose regulations within the SNIP to prioritize service expansion.

Furthermore, the evaluation concluded that service quality regulations lack the momentum and reach needed to regulate the SSP service quality. In addition, the SUNASS does not possess the resources to regulate numerous SPP. Therefore, the first project should analyze and propose alternatives to complement and strengthen quality regulation, possibly assigning responsibility to the municipalities where SPP operate. Measures should be analyzed and proposed to strengthen the capacity of the MOH and the municipalities to carry out their regulatory function, which they are currently not doing.

The second, third, and fourth pilot projects would benefit: (i) small urban and rural communities, which currently supply themselves from springs or streams; (ii) peri-urban zones that receive water service from tanker trucks; and (iii) peri-urban areas with services similar to the APPJ that were successfully implemented in Lima in the late 1990s, or to the condominial services implemented in Lima in recent years. Thus, the three pre-identified investment pilot projects correspond to the three categories of the SSP service for the population without access to utilities.

### ***Second pilot project: Expansion and strengthening of SSP in small urban and rural communities.***

**Comment:** Approximately a quarter of the population within the jurisdiction of the utilities has no access to public services whereas another quarter is supplied by communal SSP such as JASS. These populations, together with rural inhabitants who lack service, total approximately three million, of which two million live in the jurisdiction of utilities and another million in rural communities. The challenge of providing these groups with services justifies a special effort. This could be based on principles applied in many countries, such as Colombia and Chile, which are listed below:

- Private or community SPP could bid to provide services to individual or groups of rural communities or peri-urban communities;
- The benefiting community would agree to pay a maximum tariff for the service;
- Sub-project bids would be awarded based on the lowest subsidy required per beneficiary to make the project financially viable. The subsidy would be the difference between the capitalized value of the payment to the SSP and the capitalized value of the payments agreed upon with customers;







- Where no water system exists, the procedure would be the same except that the subsidies would be larger. In both cases, the Peruvian government would finance the subsidies in accordance with the schedule of payments in the SSP proposal;

This type of competitive procedure stimulates the development of small, private SSP. Boards and other communal providers could also participate, such as the Neighborhood Water and Sanitation Committees (COVAPS), which may have comparative advantages for organizing communities. Unlike the traditional systems for preparing, building and operating water systems in these communities (such as the PRONASAR, for example), this project would have the major advantage of making subsidies explicit and creating a contractual basis for controlling the quality and cost of the works, as well as of service cost and quality once the system is in operation. Output based aid is the best way to create incentives for providing service to unserved populations. Another difference between this project and PRONASAR would be the free competition among private and community SSP, promoting and making explicit the advantages of each type of SSP. This project would have to be implemented in conjunction with the first project to build capacity for regulating service quality. Regulation could be incorporated within the same forms of contracting SSP



services, thus creating a regulatory system by contract, which currently does not exist in this type of community. Another possibility would be to introduce contracting of sanitation services, at least as a pilot program given the novelty of the concept. Ideally, OBA systems could be used to pay the SSP for households systems benefiting from different types of water and sanitation systems. The project should not demand a single type of water and sanitation system; rather, SSP should be encouraged to develop and operate a range of water and sanitation systems, whether for households or communities. Initially, the investment in water and sanitation could be partially or fully subsidized on the condition that beneficiaries would pay all operating and maintenance costs to achieve sustainability of the systems.

### ***Third pilot project: Strengthening tanker truck SSP in peri-urban zones***

**Comment:** Tanker truck supplies have the highest operating costs. It is estimated that 95% of these costs correspond to operating expenses and 5% to truck depreciation (Table 16):

**Table 16. Costs of Distribution by Tanker Trucks**  
S/. per m<sup>3</sup>

Concept	Cost per m <sup>3</sup>	Relative Cost
Purchase of water	0.40	5%
Personnel and administration	2.10	25%
Fuel, oil, tires	5.00	58%
Repairs	0.60	7%
Depreciation	0.40	5%
Total cost	8.50	100%

*Source: Tanker trucks operating in San Bartolo. The operating cost is higher than in the case of tanker trucks in Ventanilla because the San Bartolo tanker trucks have to travel longer distances to collect the water distributed and because tariffs are not regulated, unlike in Ventanilla.*





The cost percentages are typical for a truck that is almost depreciated. The profitability of this service is precarious because the market can disappear if the utility installs a network; the truck is unreliable because it may require considerable, unexpected repairs; and because other tanker trucks may offer service in the area, driving down tariff prices.

Given the modest gross margins of a tanker truck business, it is unlikely that owners would be able to replace their vehicles. Until recently, used trucks could be imported, but now it is illegal to import vehicles over two years old. In addition, import duties are prohibitive at 70%. Currently, already obsolete tanker trucks are not replaced, negatively affecting profitability, service reliability and the environment.

At the same time, used trucks are available abroad. Environmental demands have escalated quickly, forcing truckers in European and North American countries to replace their vehicles even though they are not old and even though they already meet strict environmental standards.

Therefore, a project is proposed for the mass replacement of the obsolete water tankers. Assuming that each tanker truck supplies approximately 110 households,<sup>27</sup> Peru has approximately 1,000 tanker trucks. Replacing these with second-hand vehicles no more than five years old would be based on the following considerations:

- The replacement cost would be approximately US\$ 30 million,<sup>28</sup> to be paid by the truckers who replace their vehicles;
- Replacement would ensure greater service reliability and operating and maintenance costs of S/. 2/m<sup>3</sup>,<sup>29</sup> or less than 25% of the total cost. The corresponding savings could be used to reduce the tariff charged to customers, pay the



incremental costs of regulation and consolidate the financial situation of truckers;

- In exchange for the right to import vehicles without duties, truck owners would commit themselves to purchase water from regulated water sources, mainly from the utilities, and to comply with strict water quality standards;
- The Peruvian government would have to authorize the importation of duty-free vehicles;
- The project would be appropriate for concessionary bilateral financing, for example, from countries that manufacture trucks, such as Germany, Brazil, Holland or Sweden, to speed the replacement of their own vehicles through a more active second-hand truck market.

***Fourth pilot project: Replication of APPJ projects and development of condominial projects in peri-urban zones.***

**Comment:** The first APPJ systems were implemented with aid from the European Union to improve water supply and sanitation after the cholera outbreak of 1991. The program was developed in the period 1993-2001, during which time 200 water distribution systems were built that are administered by SEDAPAL. The projects consist of reservoirs that supply water to a standpipe network, through which water is distributed by hoses to homes. The reservoirs receive water

27 Productivity of tanker trucks in San Bartolo, Lima Department.

28 At December 2006 prices for trucks imported from Europe.

29 Economies estimated by comparing trucks of five and 20 years old. Data from December 2006.



from an existing SEDAPAL network or from tanker trucks. The key to the success of APPJ systems is the participation of the beneficiary communities, which contribute manual labor for building the system, equivalent to 20% of the value of the system. Equally important, communities are responsible for the operation and maintenance of the system, and form COVAPS to this end.

The APPJ systems are community SSP and represent the next step in water service after distribution by tanker trucks. The advantages are clear: the social capital of the community is developed and operation and maintenance are delegated to those who have the greatest interest in operating and maintaining the system in a sustainable manner. The systems are suitable for subsequent investments to the water supply system, such as a sewerage system. (In the first stage, latrines are generally built). The APPJ system also can be combined with private and sub-contracted SSP to operate and maintain the system. The APPJ system also can be combined with the condominial approach.

Another advantage of the APPJ systems is their lower cost as compared with tanker trucks. Distribution costs of APPJ systems are approximately 40% of those of tanker trucks. The comparison clearly shows that tanker trucks are expensive for water distribution, even though they are necessary to initially provide water in newly established settlements.

Therefore, APPJ programs should be replicated in peri-urban areas of Lima and other cities. Delegating system operation and maintenance to the community, and making the community the owner of the water system, continues to be an effective approach. Three million peri-urban inhabitants who are currently served by tanker trucks, other SSP and different types of self-supply could potentially benefit from APPJ systems.

The APPJ systems represent a low-cost alternative for providing service to these populations. Condominial systems could also be considered, as well as other systems to serve these disadvantaged groups, depending on their technical and economic feasibility.





## Departmental Map of Peru





# Annex 1. SEDAPAL Service Tariffs

Table 1. Tariff of SEDAPAL, 2000-2005 - Water and Sewerage tariffs, S/. per m<sup>3</sup>

User	2000		2005	
	S/. m <sup>3</sup>	% Usage unit	S/. m <sup>3</sup>	% Usage unit
Domestic (average)	1.11	87.4	1.23	84.4
Commercial	3.15	6.9	3.51	7.4
Industrial	3.15	0.8	3.51	0.8
Government	1.57	0.5	1.75	0.6
Social	0.87	4.4	0.97	6.8
Average/Total	1.38	100	1.54	100
Basic charge	4.10		4.45	

Source: SEDAPAL. Anuarios Estadísticos, 2000 and 2005.

This table demonstrates that no important changes have occurred in the relative weight of the different users or in the median and relative tariffs charged.

The subsidies granted to different domestic users are listed in Table 2.

Table 2. Subsidies to Metered Consumers (2000)<sup>30</sup>

Consumption Category and Range Month	Connections 1/ (000)		Metered Consumption mm <sup>3</sup> /year		Median Tariff S/. per m <sup>3</sup>	Subsidy 2/	
	Total	%	Total	%		S/. m <sup>3</sup>	S/. connect/year
<b>Domestic</b>	<b>Total</b>	<b>%</b>	<b>Total</b>	<b>%</b>	<b>S/. m<sup>3</sup></b>	<b>S/. m<sup>3</sup></b>	<b>S/. connect/year</b>
• Social	0.6	0.1	0.7	0.4	0.86	0.71	900 [2920]
• 0-20	190.0	44.1	26.7	15.5	1.17	0.40	60 [580]
• 21-30	81.4	18.9	23.9	13.9	1.04	0.53	160 [620]
• 31-50	78.8	18.3	34.7	20.1	1.16	0.41	180 [880]
• 51-80	32.3	7.5	21.5	12.5	1.39	0.18	120 [1,170]
• 81 +	15.4	3.6	16.6	9.6	1.92	- 0.35	-380 [1,330]
<b>Commercial</b>	25.1	5.8	20.5	11.9	2.98	- 1.41	-1,160 [140]
<b>Industrial</b>	3.6	0.8	6.6	3.8	2.95	- 1.38	-2,350 [370]
<b>Government</b>	3.4	0.8	21.2	12.4	1.47	0.10	630 [10,360]
<b>Totals</b>	<b>430.5</b>	<b>100</b>	<b>172.5</b>	<b>100</b>	<b>1.57</b>		

Due to rounding off, totals may not coincide.

1/ Does not include multi-household connections.

2/ Per m<sup>3</sup>, with respect to the median tariff (S/. 1.57/m<sup>3</sup>). By connection and by year with respect to the median tariff or long-term marginal cost [S/. 3.15/m<sup>3</sup>].

A negative value indicates a transfer of resources.

30 Source: Yepes, Guillermo Yepes and Klas Ringskog. "Estudio de oferta y Demanda Servicio de Agua Potable y Alcantarillado. Lima-Callao". April, 2002.





The table above shows the amount of subsidies and how they tend to increase with consumption (last column on the right). Although the subsidy per consumption unit tends to decrease as consumption increases, the annual value of the subsidy

received tends to increase with consumption because users' consumption grows more rapidly. Consequently, the subsidy granted tends to be regressive because it benefits higher income families, who generally have higher consumption.



## Annex 2. SSP Survey Data

Aspects Community	San Bartolo	Lurin	Ventanilla	San Juan de Lurigancho
<b>Legal aspects</b>				
SSP ownership	Private, communal	Private, communal	Private, communal	COVAPS communal
SSP age, years	12	14	10	5
Operating contract/license	None	None	Municipality	None
Tariff regulation	None	None	Municipality	COVAPS board
Quality control	None	None	SUNASS	SUNASS
Quantity regulation	None	None	SEDAPAL	SEDAPAL
<b>Technical aspects</b>				
Water source	Well	Well	SEDAPAL	SEDAPAL
Hours of service	8	8	9	15
Sanitation type	Piped and Latrines	Latrines	Latrines	Latrines
Method for resolving operational problems	Own personnel	Own personnel	Own personnel	Own personnel
Type of routine maintenance	Yes	Yes	Yes	Yes, quarterly
Number of people served	700	10 500	4 000	3 250
<b>Market aspects</b>				
Monthly household income, S/.	150-800	200-600	250	300-400
Educational level	Primary/secondary	Primary	Primary	Primary
Sanitary education	Yes	Yes	No	Yes
Age of community	70	No data	10	11
Property titles	Yes	Yes	No	Yes
Reason SSP exists	No utility	No utility	No utility	No utility
<b>Financial/administrative aspects</b>				
Number of SSP employees	10	140	52	2+board
SSP monthly income, S/.	8 100	4,000/communal	2,000/communal	3 500
Tariff charged, S/.	10/m3	10/m3	7/m3	6/m3
Consumption per person per day, liters	56	No data	27	23
Type of billing and collection	Upon delivery	Upon delivery	Upon delivery	Upon delivery
Financial working ratio	No data	No data	No data	No data
Investment financing	SSP	SSP	SSP	AAPJ, European Union
Accounting system	Yes	Yes	Yes	Yes
<b>Consumer aspects</b>				
Alternative service to SSP	Another SSP	Another SSP	Another SSP	SSP
Assessment of service quality	Good	Good	Good	Good
Household sanitary facilities	Toilet	Toilet	Latrines	Latrines



SSP Survey Data

Aspects Community	La Comatrana	La Angostura	El Ingenio	Saños
<b>Legal aspects</b>				
SSP ownership	Communal	Communal	Communal	Communal
SSP age, years	30	26	11	25
Operating contract/license	Yes	Yes	Yes	Yes
Tariff regulation	Municipality	Members	Members	Members
Quality control	MOH	MOH	MOH	None
Quantity regulation	None	Regional Health Office	MOA	MOA
<b>Technical aspects</b>				
Water source	Spring	Spring	Surface	Surface
Hours of service	12	19	24	15
Sanitation type	Piped(30%),latrines	Piped	Piped1/6,latrines	Latrines and piped
Method for resolving operational problems	Personal Utility	Own personnel	Own personnel	Own personnel
Type of routine maintenance	Yes	Yes	Yes	None
Number of people served	6 500	2 000	4 300	2 800
<b>Market aspects</b>				
Monthly household income, S/.	480	400	400	700
Educational level	Secondary	Secondary	Primary	Secondary
Sanitary education	Yes	Yes	Yes	No
Age of community	90	No data	80	64
Property titles	Yes	Yes	Yes	No,80%
Reason SSP exists	No utility		No utility	Expensive utility
<b>Financial/administrative aspects</b>				
Number of SSP employees	11	4	3	3
SSP monthly income, S/.	13 000	No data	8 340	3 500
Tariff charged, S/.	10/mes	No data	10/mes	7/m3
Consumption per person per day, liters	No data	No data	No data	No data
Type of billing and collection	Bill	Bill	Bill	Bill
Financial working ratio	No data	100%	48%	60%
Investment financing	SSP	SSP	Govt. aid	SSP
Accounting system	Yes	Yes	Yes	No
<b>Consumer aspects</b>				
Alternative service to SSP	SSP communal	No data	No data	SEDAM Utility
Assessment of service quality	Good	Good	No data	Poor and expensive
Household sanitary facilities	Toilet	Toilet	No data	Latrine/Toilet



### SSP Survey Data

Aspects Community	Progreso La Toma	La Victoria	Pucallpa
<b>Legal aspects</b>			
SSP ownership	Communal	Communal	Private
SSP age, years	17	10	9
Operating contract/license	Yes	None	Yes
Tariff regulation	Members	Members	None
Quality control	None	None	MOH
Quantity regulation	MOA	None	None
<b>Technical aspects</b>			
Water source	Spring	Spring	Well
Hours of service	24	24	17
Sanitation type	Latrines	Latrines	Piped
Method for resolving operational problems	Own personnel	Board personnel	Outside technicians
Type of routine maintenance	Yes	Yes	Yes
Number of people served	300	1 260	500
<b>Market aspects</b>			
Monthly household income, S/.	200	250	500
Educational level	Primary	Primary	Primary
Health education	Yes	Yes	Yes
Age of community	26		20
Property titles	No	Yes	Yes
Reason SSP exists	No utility	No utility	No utility
<b>Financial/administrative aspects</b>			
Number of SSP employees	1	1	2
SSP monthly income, S/.	50	210	2 000
Tariff charged, S/.	1/month per household	1/month	20/month
Consumption per person per day, liters	No data	No data	No data
Type of billing and collection	Bill	Bill	Bill
Financial working ratio	No data	100%	No data
Investment financing	Outside aid	Outside aid	SSP
Accounting system	Yes	Yes	No
<b>Consumer aspects</b>			
Alternative service to SSP	Springs	Streams	Other SSP
Assessment of service quality	Good	Good	Good
Household sanitary facilities	Latrines	Latrines	Toilet





SSP Survey Data

Aspects Community	Jaen	Tamshiyacu	Nauta
<b>Legal aspects</b>			
SSP ownership	Communal	Private	Private
SSP age, years	32	30	7
Operating contract/license	Yes	None	Yes
Tariff regulation	Members	None	None
Quality control	MOH	None	None
Quantity regulation	Yes	None	None
<b>Technical aspects</b>			
Water source	Surface	Well	Well
Hours of service	14	9	10
Sanitation type	Piped	Piped 25%,letrines	Piped
Method for resolving operational problems	Own personnel	Own personnel	Outside technicians
Type of routine maintenance	Yes	Yes	Yes
Number of people served	12 600	600	650
<b>Market aspects</b>			
Monthly household income, S/.	No data	400	No data
Educational level	Secondary	Primary/secondary	Secondary
Hygiene education	Yes	No	No
Age of community		123	Old
Property titles	Yes	Yes	Yes
Reason SSP exists	No utility	No utility	Expensive utility
<b>Financial/administrative aspects</b>			
Number of SSP employees	4	3	3
SSP monthly income, S/.	17 800	2 000	4 000
Tariff charged, S/.	6/mes	14/m3	50/m3
Consumption per person per day, liters	No data	22 lcd	20 lcd
Type of billing and collection	Bill	Upon delivery	Upon delivery
Financial working ratio	68%	No data	12%
Investment financing	Govt. aid	SSP	SSP
Accounting system	Yes	No	Yes
<b>Consumer aspects</b>			
Alternative service to SSP	Another SSP	Another SSP	Utility
Assessment of service quality	Good	Good	Good
Household sanitary facilities	Toilet	Latrines/Toilet	Bathroom



## Annex 3. Experiences of Small-scale Providers of Water and Sanitation Services Questionnaire

### Introduction

An estimated seven million Peruvians lack acceptable water supply services and some 12 million do not have access to adequate sanitation services. Given the problems utilities face in providing services to the unserved population, the country must urgently develop efficient, affordable solutions to serve the poor. These solutions include small-scale providers (SSP) in peri-urban and rural areas and small towns. To this end, any bias against these initiatives must be eliminated.

This study was envisioned as part of a two-stage initiative: in the first, the consultants explored the current situation of SSP participation, analyzing the different market segments<sup>31</sup> served by SSP. They then developed a proposal to improve service for market segments traditionally served by SSP. The second stage, which is not part of this study, will address the development of the work program identified in the first stage, including the implementation of proposed activities, coordinating these with the different levels of government. This study is the responsibility of the World Bank Water and Sanitation Program (WSP). The research will enable the WSP, together with its governmental and non-governmental partners, to provide strategic assistance to Peru.

### Study objective

***This study seeks to identify the reasons why SSP have arisen in Peru and to evaluate their experience, with an emphasis on SSP reach and quality, costs, efficiency and sustainability, as well as to develop a proposal for improving service for the market segments traditionally served by SSP.***

Before beginning the interview, we would like to make sure you understand the purpose of the study and would like to know if you have any questions. If everything is clear to you, we would like to ask for you for the following personal information:

Interview date:  
Interview location:  
SSP name:  
Name of interviewee:  
Position of interviewee:  
Contact telephone and address:

### Questions for Small-scale Providers (SSP):

#### ***Legal aspects:***

**Q1:** Who owns the company?

**Q 2:** How long has the company been providing service to the population?

**Q 3:** What type of contract or license does the company have to provide service and for how long?

**Q 4:** Could we have a copy of the contract or license?

**Q 5:** What entity granted the company the right to provide service to the population and who oversees compliance with the contract conditions?

**Q 6:** Is it regulated by a public entity? With respect to service? With respect to tariffs?

**Q 7:** Does the company have an official relationship with a public entity? (municipality, utility or others). What does this collaboration consist of?

<sup>31</sup> Market segments: SEDAPAL, utilities, other providers, rural areas.



**Q8:** If public entities have commitments, how have they complied with them? For example, if you buy drinking water from the utility, have you had any problems? What are they?

**Q9:** Is the company receiving any monetary subsidy to be able to provide service to the population?

**Q10:** What aid would you need from government agencies in order to expand or improve service?

**Technical aspects:**

**Q11:** Where do you obtain the water? Who is the owner of the water source used?

**Q12:** If it is from an untreated public (river, lake, etc.) or private source, how are water quantity and quality controlled?

**Q13:** In the case you use a public or private source of treated water (public utility, industry, etc.), what are the quality control measures, how much do you (the SSP) pay for the resource and to what institution?

**Q14:** What are the components of your water supply and sanitation system?

**Q15:** How many hours of service do you provide daily? If you provide less than 24 hours, why? Do your customers want more hours of service? Is there not enough water for 24-hour service? Is the capacity of certain components inadequate for 24 hours? Does the state of your operating system cause system failures?

**Q16:** If you distribute water in tanker trucks, please give us the approximate costs of the following:

- Year and approximate cost of the tanker truck;
- Cost of a new truck similar to the one you have;
- Approximate yearly maintenance expenses for the truck;
- Average annual operating costs;
- Tank volume;
- Hours of daily operation;

- Days of operation per week;
- Number of trucks your company operates;
- Approximate number of customers your company has;
- Tariff for water sales (soles per drum or equivalent).

**Q17:** Do families in the study areas have their own bathrooms or latrines? Were these provided by the company, or were they already there when the company began operations? Where does the population or community served by the SSP dispose of its liquid and solid wastes?

**Q18:** What operating problems has your company faced and how were they resolved?

**Q19:** What type of maintenance do you perform to be able to provide satisfactory service?

**Market aspects:**

**Q20:** What are the socioeconomic characteristics of the population served? Do you know the monthly income level of each household?

**Q21:** To how many households do you provide service? Do you know how many inhabitants there are per dwelling and how many people work on average in each household? What are the typical jobs they hold?

**Q22:** What educational level does the population have, on average?

**Q23:** What are the hygiene practices of the people? Do you know if a campaign has been carried out to improve hygiene practices, such as a campaign to promote hand washing with soap?

**Q24:** In what year was the community you serve founded and does it have a community organization?

**Q25:** Does the population served have titles to their property?



**Q26:** In your opinion, why do you think households request your service? Why are they not served by the utility? If you did not provide them with service, where would the people go to obtain water?

**Q27:** What percentage of households in the community do you serve? If it is less than 100 percent, why haven't the other households requested your service?

**Q28:** How many people work in your company, including you and your family members? What level of technical, accounting or administrative training do you have?

**Financial aspects:**

**Q29:** What is the monthly income of your company?

**Q30:** How much do you charge for the service? What is the average volume of consumption per household per month? How much is the average monthly or daily bill?

**Q31:** Please describe your measurement, billing and collection system.

**Q32:** Do you sell water on credit to the population?

**Q33:** Who paid for the investments in each component of the system or the assets acquired (tanker trucks)?

**Q34:** If you have received credit, who provided it and under what loan conditions? Would you be able to obtain more money loans?

**Q35:** What is the tariff structure you apply? Who approves it? May we have a copy of the tariff structure applied?

**Q36:** What type of accounting system do you use and is there someone who performs an audit? Could we obtain financial reports?

**Other general aspects:**

Thanks for answering the 36 questions. Now we would

appreciate your observations or comments in order to determine how to help improve water supply and sanitation services to populations like the ones you serve. What changes or what type of assistance would be desirable from:

- The central or municipal government;
- The utility of your municipality;
- Credit agencies;
- Others.

**Questions for consumers served and not served by SSP:**

**Q37:** When was your neighborhood founded and how long has your family lived here?

**Q38:** If you did not receive service from the SSP, how would your family obtain drinking water? Where do you dispose of excreta?

**Q39:** How would you rate the services provided by the SSP in terms of price and service quality (measured by different aspects such as water quality, continuity of service, etc.)? What are the positive aspects of the service and which aspects need improvement?

**Q40:** Even if you are receiving service from the SSP, would you prefer services from the utility or your municipality? What would be the advantages and disadvantages of services from the utility as compared with those of the SSP?

**Q41:** How would you rate the service provided by the SSP?

- Water quality; (good, average or poor).
- The way SSP employees treat customers (good, average or poor).

**Q42:** Have you or your family participated in any hygiene education or training, such as learning about the importance of hand washing and proper hand washing practices to reduce waterborne illnesses?





**Q43:** What type of sanitary facility does your home have?

- Shower;
- Toilet;
- Sink
- Latrine
- Other, specify

**Q44:** How much does your family pay for water services and excreta collection?

**Q45:** How many people work in your household and how much do they earn a month?

**Q46:** What comments or suggestions do you have to improve the water supply and sanitation services in your community?

**Questions for national, local or utility authorities regarding SSP:**

**Q47:** Why do you think an SSP exists that provides water supply and/or sanitation services in the country or in your jurisdiction?

**Q48:** As an authority, how would you rate the services provided by the SSP?:

- Water quality; (good, average, poor);
- Price of water;
- Customer relations.

**Q49:** What tariff and connection costs would households have to pay to receive water supply and sanitation services from a utility rather than an SSP?

**Q50:** Do you believe that reforms, financing or other measures are needed to enable the utility to serve the households currently served by the SSP?

**Q51:** How is the SSP tariff controlled? Do you believe controls are necessary?

**Q52:** How is the quality of the service provided by the SSP controlled in terms of water bacterial content, service continuity, etc.?

**Q53:** What government aid programs exist in your community/ municipality to expand and improve the service provided by the SSP?

**Q54:** Considering your public investment needs, what priority would water supply services have compared with other public services, such as medical care, education, urban transport, etc.?

**Q55:** We would appreciate any other information or comment on the problem of water supply and sanitation services under your responsibility or jurisdiction.

***Thanks for your cooperation!***



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