

Providing and Expanding Water Provision and Solid Waste Collection Services in Peri-urban and Rural Areas

THE ROLE OF SMALL-SCALE PROVIDERS



The Case of El Salvador within a Regional Context

Alexandra Ortiz and Carolina Piedrafita, authors



WORLD BANK



PPIAF

PUBLIC-PRIVATE INFRASTRUCTURE ADVISORY FACILITY

Providing and
Expanding
**Water Provision
and Solid Waste
Collection Services**
in Peri-urban and
Rural Areas

THE ROLE OF SMALL-SCALE PROVIDERS

The Case of El Salvador within a Regional Context

Alexandra Ortiz and Carolina Piedrafita, authors



WORLD BANK



PPIAF

PUBLIC-PRIVATE INFRASTRUCTURE ADVISORY FACILITY



Table of Contents

v	Preface
vi	Acknowledgments
vii	Acronyms and Abbreviations
1	Executive Summary
5	A. Regional Context: The Problem of Insufficient Coverage and the Role of SSIPs
15	B. The Case of El Salvador
	Water SSIPs in El Salvador
	Challenges Faced by Water Sector SSIPs
	Solid Waste SSIPs
	Challenges Faced by Solid-Waste SSIPs
29	C. Looking for a Solution: Assessment of Best-possible Options
33	D. Recommendations for Incorporating SSIPs into the Water Sector and into the Solid-waste-collection System in El Salvador
36	References
	Tables
16	Table 1: Rates of Small Water Providers
18	Table 2: Cost-Rate Comparisons between ANDA and Water Associations
25	Table 3: Cost Comparison between Direct Provision and Outsourcing
30	Table 4: Assessment of Best-possible and Second-best Options for Water Provision and Solid Waste Collection
	Boxes
6	Box 1: Francisco Alberto Chavez and SEMU: The Path from Cartwheels to Dump Trucks in San Salvador
7	Box 2: Water Association Canton la Griega, Municipality of Texistepeque, Department of Santa Ana
8	Box 3: Who are the Small-scale Water Providers?
10	Box 4: Who are the Small-scale Solid-waste Pickers?
20	Box 5: Peru: Lima’s SSIPs Servicing Water in Slums
22	Box 6: Paraguay: Output-based Aid in Paraguay’s Water Supply Sector
26	Box 7: Bolivia: La Paz’s Incorporation of SSIPs into its Waste-collection System

The findings, interpretations, and conclusions expressed in this policy note are entirely those of the authors and should not be attributed in any manner to the World Bank, its departments, its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent. The World Bank does not guarantee the accuracy of the data included in this publication or accept responsibility for any consequence of their use.

The material in this publication is owned by the World Bank's Department of Finance, Private Sector and Infrastructure, Latin America Region, and the Public-Private Infrastructure Advisory Facility (PPIAF). Dissemination of this work is encouraged. For questions about this report, including permission to reprint portions or information about ordering copies, please contact the PPIAF and/or the Department of Finance, Private Sector and Infrastructure, Latin America region at the World Bank by email at the addresses below.

PPIAF

1818 H Street, N.W.
Washington, D.C. 20433
Phone: +1 (202) 458 5588
Fax: +1 (202) 522-7466
Email: info@ppiaf.org
Website: <http://www.ppiaf.org>

or

External Affairs Unit (LCREA)

World Bank
1818 H Street, NW
Washington, D.C. 20433
Tels: +1 (202) 473 2710 / 473-7229
Email: whelpdesk@worldbank.org

Preface

Multinational infrastructure operators have always been reluctant to invest in peri-urban and rural community projects, given affordability levels and the lack of economies of scale. Moreover, public utilities have also traditionally been unable to expand coverage to these areas. Governments and donors are only now beginning to acknowledge that small-scale operators have an increasingly important role to play in the provision of basic infrastructure services to the poor by managing private systems and advancing private sector development.

Policymakers, politicians, and practitioners are now paying more attention to creating appropriate enabling environments for small-scale private infrastructure providers, since they understand that at times these entities represent the most appropriate solution to the problem of inadequate coverage, as is the case of water associations in rural areas and of solid-waste entrepreneurs in difficult-to-access peri-urban neighborhoods. Sometimes these providers are just an intermediate solution, as in the case of mobile water providers. In most cases, they are the only option for reaching the poor.

With this in mind, the World Bank's Public-Private Infrastructure Advisory Facility is supporting several country applications that seek to develop institutional frameworks and gather international best practices to support individual applications in the use of small, independent operators. This policy note is part of those efforts. The in-depth study on small providers for water and solid-waste collection in El Salvador and the workshop that led to this policy note underscore the similar challenges faced by Salvadoran Small-Scale Infrastructure Providers (SSIPs) and most SSIPs in other countries in the region. Thus, lessons learned apply extensively; by better understanding what SSIPs have to offer, municipal governments could delegate parts of service provision while concentrating on others. To enable the development and integration of these SSIPs, governments should start to treat some of these organizations as valid providers by giving them legal status and property rights, and by supervising the quality of their services and bringing them under an appropriate regulatory umbrella.

Michael Schur
Deputy Program Manager
Public-Private Infrastructure Advisory Facility

Acknowledgments

This policy note is the product of the collaborative efforts of many people. The information compiled about and analysis of El Salvador's Small-scale Infrastructure Providers (SSIPs) would not have been possible without Marino Henao and Aldo Miranda, who wrote and supervised the Research Triangle Institute's (RTI's) report. Ernesto Nosthas, José Alfredo Marroquín, Amanda Méndez Román, and José Luis Duque of the Social Fund for Local Development (FISDL) provided invaluable support in the supervision and dissemination of RTI's report, and contributed to creating awareness about the role of SSIPs in infrastructure provision for the poor. We sincerely appreciate their efforts.

We would also like to acknowledge the careful revision and comments received from World Bank experts Ventura Bengoechea, Daniel Hoornweg, Mukami Kariuki, Jean-Christophe Ngo, Manuel Schiffler, Manuel Sevilla, María Angélica Sotomayor, and Miguel Vargas Ramirez. This paper would not have been possible without their inputs and support.

Special thanks also go to Jean Christophe Ngo and Jyoti Shukla of the Public-Private Infrastructure Advisory Facility (PPIAF) for their input, advice and guidance. PPIAF's financial support was crucial to carrying out the study and the workshop that led to this policy note.

The document was revised and edited by Diane Stamm.
Graphic design by Fletcher Design, Inc./Washington, DC

Acronyms and Abbreviations

ACEPSA	Asociación Centro Ejecutor de Proyectos Económicos y de Salud, Costa Rica, Association and Executive Agency for Economic and Health Projects, Costa Rica
ADESCO	Asociación de Desarrollo Comunal, Communal Development Association
ANDA	Administración Nacional de Acueductos y Alcantarillados, National Administration for Water and Sanitation Services
CSO	Civil Society Organization
DIGESTYC	Dirección General de Estadística y Censos General Directorate for Statistics and Census for El Salvador
EMAs	Empresas Municipales de Aseo, Bolivia, Municipal Cleaning Enterprises, Bolivia
ESSAP	Empresa de Servicios Sanitarios de Paraguay, Sanitary Services Enterprise of Paraguay
EWD	Energy and Water Department, World Bank
FLADES	Fundación Interamericana Anáhuac para el Desarrollo Social, Anáhuac Inter-American Foundation for Social Development
FISDL	Fondo de Inversión Social y Desarrollo Local Social Investment and Local Development Fund
FPSI	Finance, Private Sector and Infrastructure Department, World Bank
GTZ	German Agency for International Cooperation
ILO	International Labor Organization
IPES	Empresa para la Promoción del Desarrollo Sostenible, Perú, Enterprise for Promoting Sustainable Development, Peru
ITC	International Training Center of the International Labor Organization
MDGs	Millennium Development Goals
NGO	Non-governmental organization
PLANSABAR	Plan de Saneamiento Básico Rural Basic Plan for Rural Sanitation
PPIAF	Public–Private Infrastructure Advisory Facility, World Bank
RTI	Research Triangle Institute
SEMU	Servicios Múltiples, Multiple Services
SENASA	Entidad Rectora del Agua en Areas Rurales, Paraguay, Main Agency for Water Provision in Rural Areas in Paraguay
SSIPs	Small-Scale Infrastructure Providers
UCA	Universidad Católica de El Salvador, Catholic University of El Salvador
UNICEF	United Nations Children’s Fund
WASTE	Advisers in Urban Environment and Development, the Netherlands
WHO	World Health Organization

In most developing countries,



and particularly in Latin America, Small-scale Infrastructure Providers (SSIPs) are proving to be responsive to the needs of the poor. They might be delivering water services through small private networks in urban areas or water associations in rural areas, or collecting solid waste in wheelbarrows, but they make their services available to the poor by using cheaper technology, reducing service standards, and permitting flexible payment schemes. These alternative providers are filling a gap in service provision to underserved rural and peri-urban areas.

The safe water coverage rate in the region is 86 percent (World Bank 2004a:11).¹ Solid-waste-collection coverage averages about 70 percent in large Latin American cities with populations of more than 1 million, while in smaller cities this coverage is estimated to range between 50 percent and 70 percent (Arroyo, Rivas, and Lardinois 1997). With rates that are still far from universal, and considering that it is normally the high-middle-income population

that enjoys regular service while low-income neighborhoods and rural areas have erratic service when they get it at all, Latin America's situation urgently calls for a scheme that can expand service provision in the short run. Large public and private investments alone will not be able to increase coverage of infrastructure services to the extent needed. All actors, public and private, large and small, need to participate to expand coverage in

¹ This indicator refers to "access to an improved water source".

the near future. SSIPs are an important part of the private sector, but they are often understudied in policy research or disregarded in policy planning, while attention is given to large providers. They are often seen as a temporary solution either because their sectors are considered a natural monopoly or because global technical standards sometimes do not recognize SSIPs modes of service. Even if SSIPs might not be the panacea for coverage expansion in all cases, they represent a good solution for rural areas and a viable solution for underserved peri-urban areas if quality and price are regulated, as we argue in this policy note.



Mobile provider: water tanker serving low income neighborhood
Photo from World Bank Photo Library

With this in mind, and taking into account that no knowledge on SSIPs of water and solid-waste collection existed in El Salvador, the World Bank obtained funding from the Public–Private Infrastructure Advisory Facility (PPIAF) to carry out a study on the subject (Henao 2004). The study was supervised by the Research and Development unit of the Salvadoran Social Fund for Local Development (FISDL) and the urban group within the Finance, Private Sector and Infrastructure Department for Latin America of the World Bank.

El Salvador has one of the lowest water-coverage rates in the region; only 57 percent of the population has household connections (DIGESTYC 2004). This is well below the regional average of 75 percent (WHO/UNICEF 2004). Similarly, solid waste collection coverage in San Salvador’s metropolitan area ascends to 70% while in the rest of the country coverage averages 50%. Specifically, coverage for poor urban areas ranges between 50 to 60%, while poor rural areas are almost completely unattended with coverage as low as 2–5%. Within this context, a private sector of SSIPs, formal or informal and with different levels of organization, has sprung up to fill in the gap in water provision and solid-waste collection. These providers have managed to supply services to a large segment of the Salvadoran population that would not otherwise have access to them. In a sample of 30 municipalities out of a total of 262, the study found 159 SSIPs: 30 mobile providers (an average of 1 per municipality), 65 water associations, and 64 microenterprises of waste pickers. The study aimed to provide a snapshot of the reality of these SSIPs in the country, and to assess the way they work and how the institutional and legal frameworks shape the way they operate. It also made recommendations to the government on how to best support these SSIPs where their services appear to be suitable and the only option for serving the poor.

This policy note presents the results of this study and uses the Salvadoran example to showcase the role of SSIPs as a viable alternative in certain contexts to expand affordable service coverage in the region in the near future, without sacrificing quality. Information on lack of coverage and the role of SSIPs in Bolivia, Lima, and Paraguay is provided for regional comparisons and to highlight specific solutions to the same problems faced by El Salvador. The Salvadoran case is based on primary data, while international experiences have been taken from the available literature and World Bank experience with small water and solid-waste entrepreneurs.

This note is directed to policymakers, regulators, and government officials. It illustrates the advantages and disadvantages of allowing SSIPs to complement infrastructure service provision by public services and large providers to reach the poor, and provides advice on how it could be done better. By improving their understanding of what SSIPs offer, municipal governments would be able to delegate parts of service provision while maintaining a supervisory role and concentrating on others.

To successfully incorporate SSIPs into service provision, public authorities will need to treat the most cost-effective of them as valid service providers, give them legal status, facilitate their investments, control the quality and supervise the pricing of their services, and bring them under a regulatory umbrella. *Regarding water provision* in El Salvador's urban areas, the government could have the medium-term goal of extending the main provider's water network. In the meantime it could create the conditions that permit SSIPs to provide water with adequate quality standards at an affordable rate. In rural areas, the government could widely support water associations as the best-possible solution. *Regarding waste collection*, we argue that SSIPs have a competitive advantage in serving spread out and/or difficult access areas. While maintaining the responsibility for waste management, municipal governments could benefit from outsourcing waste collection to a mix of small and medium enterprises and concentrate on other areas such as waste disposal strategies. The adoption of these measures would better serve the interests of the poor and provide for a new avenue in reaching the Millennium Development Goals in the water, sanitation, and waste-collection sectors.



Water trucker serving a poor community
Photo from World Bank Photo Library

Section A of this note addresses the problem of insufficient coverage in water services and solid waste collection in the Latin America region and how SSIPs appear to fill this gap. Section B discusses the experience of Salvadoran SSIPs in water provision and solid-waste collection, and describes the challenges they pose and opportunities they offer in a country with one of the lowest coverage rates in the region. The case is complemented by international experiences that show that El Salvador's situation is common to all countries in the region. Section C considers when and how to incorporate SSIPs in each sector. Finally, Section D offers specific recommendations for El Salvador.

A. Regional Context

The Problem of Insufficient Coverage and the Role of SSIPs

Millions of small entrepreneurs

have set up businesses to serve the poor families that live in rural and peri-urban areas in Latin America. The story of two of these entrepreneurs, who themselves come from poor areas, is described in Boxes 1 and 2. Regional indicators show that in terms of infrastructure service provision, such as water or solid-waste-collection services, these poor areas are the worst served; 26 million people (7 percent) of the urban population do not have access to water, and 50 million (13 percent) do not have access to sanitation.

This contrast is even more striking in the rural and peri-urban areas of the region, where these figures climb to 49 million (or 39 percent of the population) and 66 million people, respectively, (52 percent of the population).² In addition to the issue of service coverage, there are also problems with the quality of the service provided, since not all those covered receive quality water in a reliable and continuous way. Similarly, low-income neighborhoods that grow at city limits, and small rural towns, traditionally have been underserved in terms of waste-collection services.

Regional data estimate that solid-waste-collection coverage averages about 70 percent in large Latin American cities that have populations of more than 1 million, while in smaller cities this coverage is estimated to range between 50 and 70 percent (Arroyo, Rivas, and Lardinois 1997). Besides deficient waste collection services, waste disposal strategies in the region are also underdeveloped.

Thus, while the public system provides water to 320 million people in the region, there are 60 million people served by private providers and 76 million

² Calculations by María Angélica Sotomayor, based on data from *Quick Reference Guide to the World Development Indicators, 2004, Little Data Book*, World Bank, Washington, D.C., 2004a.

Box 1

Francisco Alberto Chavez and SEMU

The Path from Cartwheels to Dump Trucks in San Salvador

After 30 years of living and working as a scavenger in Mariona's open dump, Francisco Alberto Chavez has emerged as a solid-waste entrepreneur that provides collection services to more than 100,000 people (16,400 houses and two wholesale markets) in San Salvador and Soyapango. He started small 10 years ago as a waste picker with a manually operated cart serving a few households that lacked collection services in the nearby communities. He now transports 30 tons a day from the Central Market to the sanitary landfill Cipes-Mides in Nejapa, and has won the bids to transport 32 tons a day from the wholesale market La Tiendona. He also carries 10 tons a day from peripheral markets. His company, Servicios Múltiples (SEMU), employs 53 people. To achieve this, he has come up with original technical solutions for the collection of solid waste in peri-urban neighborhoods and has adapted solid-waste trucks to transport organic waste from San Salvador markets. He has also used innovative contractual modalities (outsourcing of 17 trucks) to minimize risk and maximize the use of capital.

people that get water through other arrangements, such as a SSIP, or by taking it directly from a water source. In terms of solid-waste collection, a conservative estimate³ yields a figure of 51 million people served and 77 million people underserved (World Bank 2004) and who dispose of their garbage in unsupervised open dumps. Furthermore, most countries in the region lack a subsidy policy to serve the poorest segment of the population.

One of the reasons why there is low water provision and waste-collection coverage in Latin America is that the institutional arrangements in place are not conducive to a considerable extension of coverage in the short run. The institutional evolution of these two sectors can be summarized as follows:

- Publicly owned, centralized systems of water were established in the 1950s to deliver services in a number of countries in Latin America, and some achieved it with relative success. Centralized service provision from a national water utility was the predominant model until the 1970s, and it is still widely used. This arrangement increased coverage, but not to all. The scheme lacked the incentives to offer services to small towns and peri-urban and rural areas that had higher operational costs than those from concentrated urban areas. Under this system the municipal government remained detached from the provision of water service.
- Decentralized systems were implemented in the water sector in the 1980s, following the wave that induced changes in the provision schemes of almost all public services. The underlying assumption was that the drinking-water supply would be better and more efficiently managed when delegated to the municipal level or to the lowest-possible appropriate level. Solid-waste collection had always been a municipal responsibility and remained so. But

³ We reached this figure by using as a base the coverage average of 40 percent in the low-income areas of big cities in the region such as Asunción, Caracas, Lima, Managua, San Salvador, and Tegucigalpa (World Bank 1997).

municipal provision was carried out with mixed results in both sectors; under such a scheme service providers became closer to the end user, but with the exception of a few cases, this did not lead to more efficient provision of services (Network 2004). Municipalities often set tariffs that were too low to cover costs, since tariff increases were sensitive for political reasons. Extensions of coverage were often made arbitrarily and insufficiently because municipalities lacked the necessary funds to expand service to the extent needed. As a result, in many cases the service provided was of low quality. In solid waste, direct provision through municipal authorities later proved to be more expensive than if outsourced to a third party, either public or private (Haan, Coad, and Lardinois 1998:iii).

- In the 1990s the Latin American model changed to setting up public–private partnerships at the municipal level for both water provision and solid waste management. But while private arrangements brought some improvements in efficiency and increased water-coverage levels over purely public provision schemes, they still did not achieve great coverage extensions, particularly in poor or remote areas. Contrary to general perceptions in the water and sanitation sectors, empirical evidence indicates that private companies or public–private partnerships do not generally bring in large sums of money in capital investments. In most cases private managers run the utility more efficiently and are able to reinvest the revenues derived from the business. It soon became evident that with public utilities or large private providers alone, a big extension of coverage would not happen. Public–private partnerships at the local or community level were also needed either in the form of outsourcing, management contracts, or concessions, among others.
- In the waste-collection sector, privatization was more successful, and it has been widely proven

continued on page 12

Box 2

Water Association Canton la Griega, Municipality of Texistepeque, Department of Santa Ana

This water association was created with the help of a local nongovernmental organization and operates with the continuous efforts of its members. The water source is an artificial pond built in 1945 with the help of a public foundation. In recent years, the community invested \$1,143 to clean the pond, and the water has been analyzed and is considered suitable for human consumption. The system provides water to 1,120 people through 224 household connections.

The source feeds a storage tank that is 10 kilometers away at a rate of 20 liters per second. The association does not have water meters and charges a monthly fixed rate of \$3.43 per household connection. Invoices are generated manually and payments can be made at the association's office. Revenues average \$750 per month. A volunteer community board administers the system, and a firefighter and two maintenance personnel staff the association. Employees' pay and the cost of electricity constitute the association's total expenditure of about \$538.

Who are the Small-scale Water Providers?

SSSIPs that provide water range from informal well owners who either sell water at the source (directly to consumers or to another SSIP, or to a middleman that will distribute it per household), distribute water by truck, or even operate small piped-water systems that must often lower service standards^a in order to provide services at lower cost to those with financial concerns, and/or to adapt to different levels of demand, such as two or three hours a day. There are many variations on water SSIPs, and varied market niches and business models. For example, a distinction can be made between mobile providers (mostly tanker trucks) and fixed networks (piped delivery).^b Network operators have substantially lower costs and prices per cubic meter sold than mobile operators, who often offer higher costs and lower volume of service, but who can also operate in an environment of greater regulatory risk,^c or even meet seasonal demand fluctuations. Many network operators started as mobile operators and then invested in fixed facilities when they had the resources and faced a lower risk of expropriation.

Further categorization within these two groupings of providers is possible. A mobile provider may operate its own water source, buy from a third-party private source, or just retail water purchased in bulk from the trunk utility. Truckers may serve households directly, deliver water to a community storage tank, or even supply a local fixed network serving a group of standpipes or house connections. Private well or source operators can serve tankers, but also offer backup service to the official utility during periods of drought. Diversity is endless because small entrepreneurs must permanently adapt to their clients' needs. Characteristics common to them all are that they operate with limited government oversight, no government support, and must compete for customers.

Network providers can also be differentiated within their own grouping since they can be owned and/or operated by either a private entity or by the community they serve. The owner does not need to be the operator in most cases. Systems owned and managed by the community they serve are known as water-user associations. Systems owned by the community they serve but that are operated by private management are known as water associations. Both water user associations and water associations are not-for-profit and have recognized legal status. Of the array of network providers, water and water user associations represent an improvement over informal providers

^a Lowering service standards relates to the fact that some piped system operators provide intermittent services or services at a lower pressure.

^b This categorization was taken from Solo (2003).

^c The reason why most operators do not lay water pipes underground and start a "fixed" type of service (less people can be reached at the same cost using tanker trucks) is directly related to the risk attached to doing so. Most countries, including El Salvador, state that the public national utility is the only entity that should provide water to the population. Thus, it can claim proprietorship over any kind of water-provision system in the country. That is the risk of expropriation: if you create a piped system in a highly risky environment such as El Salvador, the national utility can legally take it over (because the original provider never had a legal right to do so).

because they are (a) legally recognized and (b) liable to the community they serve. Water associations are a preferred provider over water user associations since not all rural communities have the know-how to operate water services.

Given the different characteristics of urban and rural areas, SSIPs that predominate in each area tend to be different. Informal SSIPs, either mobile or with a network, are usually more prevalent in urban areas where a large concentration of population makes service provision more profitable. Water associations or water-user associations more commonly serve rural areas and appear less frequently in urban areas.

Service levels of water SSIPs vary with provision options: an individual with a cart can reach between a 100 to 200 people a day; a trucker that carries water house to house can serve 350 to 700 households a day. More complex network systems can serve from a hundred to several thousand households. These providers serve mainly low-income customers, but sometimes they can include middle- and high-income settlements that are located away from the main provider's network.

Cost for service from water SSIPs varies, but they may charge more than what the main public-private provider would if offering the service through a piped network. Trucked water is more expensive than piped water, and a regional study that sampled six large Latin American cities showed that the cost increases of SSIPs was around 4 to 10 times the public's network unit price (Solo 2003). These data contradict some of the literature on these providers that cite an increase of 20 to 150 times. Furthermore, some small network operators in small cities compete favorably on price with the main utility, even when they get no subsidies. The main reason for lower tariffs, when they occur, is that main providers often receive subsidies and are not obliged to recover their capital investments through tariffs. SSIPs that deliver water by tank transfer the high transportation costs to the price of water.

Who are the Small Solid-waste Pickers?

Solid-waste collection SSIPs can take many forms.^a A recent study in Latin America identified four categories within this type of entrepreneur: (a) small entrepreneurs offering services directly to the population with municipal approval, (b) informal waste pickers who have organized themselves with the backing of philanthropic organizations or on their own initiative to protect their livelihoods, (c) entrepreneurs who have organized their service units with support from the community served and who operate without municipal approval, and (d) organizations that have been created at the initiative of the municipal government and operate with its support.

Typically, these SSIPs consist of 5 to 10 people, including the owner, that collect trash by hand going from house to house using a wheelbarrow. Given the intensive work implied in waste collection, the service provides only a supplemental income for the owner-operators. There are two primary payment and collection methods for the service. In the first, the client pays the SSIPs directly. In the second, the public pays service fees to the municipality or the utility company; the municipality or utility must then pay the SSIPs the amount established in the service contract. In all cases, SSIP workers complement their income with revenues from recycling some of the waste collected.

The variety of entrepreneurial forms that exist can operate in every part of the solid-waste cycle. Most of them provide primary collection services (from the residence or commerce), along with sweeping and cleaning of public streets, parks, cleaning of canals and storm drains, and separation at the source. Slightly bigger entrepreneurs engage in secondary collection (transportation to the final disposal site). In most cases, the SSIPs have both a principal and many secondary activities. Most of these entrepreneurial forms were conceived of and promoted as a means to provide urban waste management to the poorer communities, but in some cases their collection services had been restricted to those with the ability to pay.

Capital investments in these businesses are low and consist of a few tools such as a wheelbarrow, a barrel, and a shovel, or even a cart and horse. Vehicle ownership is rare, but some entrepreneurs rent or lease them. These enterprises tend to coordinate with the municipalities to collect the trash and take it to transfer points, or they integrate their operations with routes of municipal vehicles that transport the waste to their disposal site.

Solid-waste SSIPs have a peculiar relationship with municipalities, depending on the country. Some operate under contract with them and have to comply with strict regulations on price, routes, and disposal. Others operate independently, choosing their clients and prices. In other cases they operate under municipal authority without explicit contracts. Even when a particular municipality has no contract with its SSIPs, the SSIPs are dependent on the municipalities for permission to dispose of collected waste in municipal landfills that are generally

^a These categories are based on those developed by Arroyo, Rivas, and Lardinois, 1997, Chapter 2.



Small scale garbage collector accommodating the contents of his cart
Photo from World Bank Photo Library

administered and controlled by the municipality. The coordination that must exist between the SSIPs, which are not normally involved in final disposal, and the municipal vehicles which are or should be, is the source of a common dependency relationship.

In the case of solid-waste collection there is no information on higher tariffs being charged to clients when compared to municipal fees. This is not really a consideration since municipalities often outsource their services to these small providers, charging a single fee. However, from the municipality's perspective, contracting out solid-waste-collection services represents a savings of up to 30 percent according to international experiences. Cost reductions have come mainly from a more efficient use of resources by private operators that are motivated to minimize costs in order to maximize profits and be more competitive. In contrast with municipal entities, the private sector has had managerial flexibility and freedom of action to reorganize the workforce that the public sector lacked, and has been able to reward or penalize poor performance (Haan, Coad, and Lardinois 1998:iii).



Pepeadores (waste collectors) waiting to dig through the garbage in search of recyclable material to sell
Photo from World Bank Photo Library

that municipalities achieve considerable savings and could adequately extend coverage by outsourcing services to private operators while maintaining the responsibility for service provision and an oversight role. International experience has shown savings of almost 30 percent over municipal provision of these services (Haan, Coad, and Lardinois 1998:iii). Cost reductions have come mainly from a more efficient use of resources by private operators who are motivated to keep their costs down in order to maximize profits and be more competitive. In contrast with municipal entities, the private sector has the managerial flexibility and freedom of action to reorganize the workforce that the public sector lacks, and has been able to reward or penalize poor performance. However, large public or private solid-waste-collection providers tend to leave behind peri-urban areas with difficult road access, such as shantytowns, or simply rural areas that are far away from serviced areas. The reasons for this are that operational costs per ton of garbage collected increase as the population density decreases, and the equipment used by large providers is not adequate for the topography of peri-urban areas.

Another explanation for the lack of extended coverage in the Latin America region is related to the fact that conditions for service provision in peri-urban and rural areas are very specific and difficult. Rural areas have low population density, making it expensive to cover it all, and in most peri-urban areas, access is difficult because the streets are too narrow for garbage trucks to operate. Few countries have been able to figure out how to efficiently serve peri-urban and rural areas. Urban areas generally subsidize rural and peri-urban populations in economic terms, although this scheme is not always successful, with rural and peri-urban areas remaining largely underserved. Coverage of the poorest population requires subsidy schemes that can be either applied to service costs (cross-subsidies) or to a connection fee in the case of water services (a one-time investment). Cross-subsidies predominate, even if they do not favor the poorest population not connected to water sources, or those who are underserved by waste-collection services.

Given this situation, a small and often informal private sector of SSIPs has sprung up to fill in the gap for water provision and solid-waste collection in underserved urban and rural areas. These providers

have managed to serve a large segment of the population in the Latin America region. No accurate estimates on these providers' coverage exist, although they are known to supply water to a large percentage of the 76 million people reported underserved. With respect to solid-waste collection, one study estimates that microentrepreneurs provide coverage to at least 2.4 million people in the region (Arroyo, Rivas, and Lardinois 1997). (See Box 3 for an in-depth description on Small-scale water providers, and Box 4 for a description of Small solid-waste pickers.)

Unlike large providers that mostly offer a one-size-fits-all service, SSIPs recognize the range of circumstances and markets in which the poor might resort to alternative sources, and give them price and quality bundles to match their needs. Since they arise to satisfy a community need, they are flexible enough to adapt to service underserved rural and peri-urban areas alike. Some providers make their service affordable to the poor by using low-cost technology or by offering lower quality than the main provider. Others offer better customer service such as flexible payment methods, low or no connection charges in the case of water, restricted water provision, or fewer waste-collection dates. Even if SSIPs are not a panacea for coverage expansion in all cases, they represent a good solution for rural areas and a viable solution for underserved peri-urban areas if controlled for quality and tariffs. For customers who do not live in a serviced network, cannot afford a water connection, or live in remote and/or inaccessible places, these providers may be their only option.

SSIPs represent an important part of the private sector for infrastructure service provision that is often overlooked by policymakers and understudied by policy analysts, who tend to focus on large, private concessions. They are often seen as a temporary solution either because their sectors are considered a natural monopoly or because global technical standards sometimes do not recognize SSIPs modes of service. As a result, SSIPs exist and operate

widely in the Latin America region, but in most countries their role is not part of a well-thought-out and articulated strategy. On the contrary, they operate on a case-by-case basis without adequate legal frameworks or standardized contracts.

In this context, the World Bank and FISDL selected the Research Triangle Institute (RTI) to conduct a study of water and solid-waste-collection SSIPs in El Salvador. The country was selected because it has one of the lowest coverage rates of both water provision and solid-waste-collection services in the Latin America region, while at the same time there are a significant number of SSIPs. The study, the first of its kind in the country, provided an excellent snapshot of the reality of these SSIPs, assessed how they work, and studied the institutional and legal frameworks in which they operate. To illustrate the solutions found to problems similar to those faced by El Salvador, the next section also discusses good practices in Peru, Paraguay and Bolivia.

Boy looking for garbage to use or sell
Photo courtesy of Chris Jennings



B. The Case of El Salvador

Water coverage in El Salvador

is worse than in most countries in the Latin America region. Only 57 percent of the population has household connections, and 29 percent obtain water from a well, lake or river. Urban coverage reaches 73 percent and rural coverage only 31 percent (DIGESTYC 2004).

Water SSIPs in El Salvador

The country also ranks low compared to the regional average of 75 percent coverage (WHO/UNICEF 2004).⁴ A study (RTI 2000) shows that an investment of \$1,143 million over a 10-year period would be required to provide total coverage of water and sanitation in the country, not including operation and maintenance costs. Investments, however, are nowhere near that level: the investment budget for the *Administración Nacional de Acueductos y Alcantarillados* (National Administration for Water Services, ANDA) for 2002 was \$14.6 million. This amount was reduced to \$4.9 million in 2003. In addition, the Salvadoran FISDL invested \$30.6 million in 713 water and sanitation projects between 1999 and 2004.

A 1961 Salvadoran decree⁵ declared that water resources are a national asset and that ANDA has preferential rights for use or exploitation of any water source. The decree established that ANDA was intended to favor a state monopoly model; it mandated municipal governments to relinquish responsibility for their water systems to ANDA. The transfer, however, met strong resistance from the municipalities, and to date there are still 68 municipalities that run their own water services. ANDA provides water to only 182 of the 262 Salvadoran municipalities and shares basic provision with a variety of other service arrangements. These include: (a) 68 municipalities that never turned in their systems, (b) 7 community associations that have an agreement with ANDA to administer their own system

⁴ Coverage indicates the number of household connections.

⁵ Decreto 341/61.

within a decentralization pilot project, (c) self-served private systems, (d) and an array of SSIPs.

A number of private SSIPs, formal or informal, for profit and non-profit and with different levels of organization, have emerged in the last two decades to fill the gap for water provision in underserved areas—40 percent of the population. In a sample of 30 municipalities, the study found 95 water SSIPs, of which 30 were predominantly mobile providers working in peri-urban areas and the remaining 65 were water associations or water user associations.⁶

The 30 SSIPs found serving peri-urban areas within the study sample range from well owners that sell the water in bulk, to middlemen that deliver it house to house, to some providers that operate a small network linked to a well, and offer different levels of service.⁷

However, the presence of these kinds of SSIPs is not as prevalent as in other countries in the region, such as Paraguay. The study sample shows that on average there is one provider of this kind per municipality. There is no precise information available on their level of coverage, but data from the 1998 Salvadoran multiple household survey show that 6 percent of total households in the country were getting their water from tanked trucks (RTI 1998a).

An analysis of these providers' rates shows that they charge from \$0.50 to \$5.75 per cubic meter (see Table 1), a higher price than the \$0.29 charged by ANDA. This higher cost can mainly be attributed to high transport costs for tanked water, and to the fact that these providers lack any public subsidies, in contrast to ANDA.⁸ It is also important to note that even if costs are higher in some cases, and if water provided

Table 1: Rates of Small Water Providers

Small Water Provider	Cost per Cubic Meter (\$) Rate for Middleman	per Cubic Meter (\$) Rate to Final	Consumer per Cubic Meter (\$)
With tanked trucks or container in trucks	0.44-0.50	N/A	2.50-5.75
Well owner selling at the source	N/A	0.44-0.50	0.75-1.25
Well owner with household connections	N/A	N/A	0.50-1

N/A=Not Available

Source: Authors' compilation based on Henao, 2004

⁶ See Box 3 for an extended definition of mobile providers, water associations and water user associations.

⁷ Examples of different levels of service include provision of water for only a few hours a day or through a shared water connection outside the household that supplies many families. This is in contrast to a higher standard of service that provides water 24 hours a day through a safe water connection.

⁸ The RTI study shows that ANDA sells water at \$0.29, even when production costs are as high as \$0.40.

through piped systems is always cheaper than water provided by tanks, the biggest cost differences found in the sample were just 11 times higher. Assuming that the quality of the water provided is comparable, this contrast is not as large as the 20 to 150 times higher costs that are sometimes attributed to water SSIPs in Latin America.

Among these small providers water quality varies considerably depending on their source. Some obtain it directly from ANDA, while others have their own source (for example, groundwater from wells or rivers) and sell it with or without treatment. A study conducted by the Catholic University of El Salvador and the Anáhuac Inter-American Foundation for Social Development (Fundación Interamericana Anáhuac para el Desarrollo Social, FIADES) (RTI 1998b) showed that water from wells in different areas of the country could contain high levels of iron and manganese. This water would require special treatment, beyond chlorination, to make it suitable for human consumption.⁹

The 65 sampled water and water user associations in El Salvador are community-based, not-for-profit organizations that provide services in rural areas and distribute water through household connections. They are created either as (a) Private Communal Associations (Asociaciones de Desarrollo Comunal, ADESCOs), comprising at least 25 members that adopt a common legal framework, are ruled by a general assembly, and are registered in the Municipal Council, or as (b) nongovernmental organizations (NGOs) or Civil Society Organizations (CSOs) registered with the Ministry of the Interior. A single municipality can have several associations.

These associations have high coverage and acceptance rates in rural areas. In the sampled municipalities they serve 172,319 people through 24,617 household



Girl carrying water home from a nearby source
Photo from World Bank Photo Library

connections. The average number of household connections in the associations sampled is 379.

Of the total sample, 24 associations provide continuous service and the rest provide it for an average of eight hours a day. Half of the associations sampled take their water from a spring, and 41 percent drill a well. More than 60 percent (45) treat the water with chlorine, and some of them analyze their water quality regularly, even though this is not mandatory.

⁹ Contamination by iron or manganese is not desirable, but it is less harmful than e-coli or other bacteria that can be eradicated with chlorination.

Most Salvadoran water associations were created to assume the management of rural water systems that had been built by the Basic Plan for Rural Sanitation (PLANSABAR), a program carried out in the 1980s by the Ministry of Health. In 1995 these water associations were required to transfer their water systems to ANDA, but 19 of these retained management and operation rights. Other water associations manage systems that were built with seed capital and the technical assistance of international NGOs.

Salvadoran water associations are run by community boards and have an average of four employees that provide administrative support, deal with payments, operate and maintain the pumps, and attend to any plumbing problem that might arise. In almost all cases, the board is comprised of community members that receive no salary.

Of the 65 water associations reviewed 63 charge a fee for services. Fifty-two charge a fixed monthly rate. Only 11 that have meters charge rates that are linked to consumption patterns. Maximum rates in the different regions are around \$8 and \$13 per month, while in the northern region rates are much lower, with a maximum of \$1.71. The reason for the low rates in the north is that there are more small systems operated by gravity, while the remaining regions have

bigger systems that require pumping. The average monthly tariff charged by associations is equivalent to \$3.64 a month. An estimate of consumption levels per household yields an average range of 15 to 23 cubic meters a month. This estimate is consistent with data from the few associations that have meters.

The majority of these associations (38 of 65) that operate systems that require pumping have obtained a partial subsidy on electricity expenses. Table 2 presents an approximation of cost and rates per cubic meter for both water associations and ANDA. Of interest is that even if water associations offer water at a higher rate than the main provider, ANDA's rate does not cover its costs. The table shows that ANDA operates with higher subsidies than the partial ones received by some water associations.

Water associations in rural areas have proved to be the best available option, given the high costs involved in extending main networks. With adequate management and investment levels, these associations have brought water coverage to rural areas at an affordable rate. Most of them started with some kind of financial and technical assistance, but they have managed to continue operating on their own. In contrast, providing water by tanks has proved to be a viable solution in El Salvador's peri-urban areas, even if inferior compared to having a connection to a main

Table 2: Cost-Rate Comparisons between ANDA and Water Associations

Provider	Working Ratio ^a	Cost per Cubic Meter (\$) ^b	Rate per Cubic Meter (\$)
Water Associations	<1.0	no data	0.29-1
ANDA	>1.2	0.40	0.29

a. A working ration bigger than 1 mean that the company does not cover its operational costs with tariffs charged. A working ratio below 1 means that the company has some level of recovery of its investments. Best practices recommend a working ratio of 0.7 or any value below 1.

b. These cost calculations do not include asset depreciation or financial costs of invested capital.

Source: Authors' compilation based on Henao, 2004

water provider. Together these providers service almost 40 percent of the country's population, yet they are not supervised by public authorities and still face many challenges to their development and sustainability.

Challenges Faced by Water Sector SSIPs

Even if they represent a less convenient option for water provision in some peri-urban areas, mobile SSIPs are the only one available. Still most of them are serving a small percentage of the urban population at a higher cost with low quality standards, mainly due to: (a) the lack of a regulatory framework that would eventually allow them to exploit water sources, invest in piped water systems, and hold property rights on the systems without the risk of expropriation¹⁰; and (b) fear of privatization of the water sector tailored to fit the specifications of large providers. Another often-cited drawback in their service provision is the fact that mobile providers are less accountable to the communities they serve than network providers, which adds an additional risk to their services since dissatisfied customers rarely have a place to complain. The Lima Case (see Box 5) shows how mobile providers in Peru improved their service in the face of the same limitations.

Water associations in El Salvador are still at an early stage of development. They have been recognized for the services rendered in rural areas, have legal status, and are accountable to the communities they serve. However, they are not being supported by a government policy to promote their development, enhance their capacities, or assist them financially in extending their services. All water associations surveyed still claim ownership of the water systems they operate, along with exploitation rights. They lack titles over the association's land and the



Boy bringing water home from a nearby water source
Photo from World Bank Photo Library

infrastructure to capture, store, and distribute the water, and they continue to demand the legalization of the rights of way over the land where they lay their pipes. In most cases they hold property rights only over their office space and their water pump. Paraguay's case, described in Box 6, represents a best practice on how public authorities have supported the incorporation of water associations into the national water provision system, even as these stay within the private sector.

¹⁰ See footnote C in Box 3, page 8.

Peru

Lima's SSIPs Servicing Water in Slums

The regional trend shows that SSIPs that operate network systems are replacing those that offer water in tanks. Water provided through network systems is more affordable for consumers than water provided from tanks and is of better quality. However, Peru has very strict laws against the installation of water networks by private operators. In such context, an intermediate arrangement has been set up in Lima's squatter settlements: water truckers maintain and supply large holding tanks that rely on gravity to distribute water to several standpipes, and employ residents to control a network of hoses running into each house, and to collect payment. This system was first introduced by international donors to give incentives to the communities to manage their water system, but later gave way to mini concessions with truckers that offered the best price. Truckers have gladly used the holding tanks, increasing their own revenues and improving water quality through chlorination. They have not invested in new water tanks, however, because of regulations that transfer all infrastructure assets to the public company.

This option is more expensive than direct provision by a main provider or through a private network system. It represents an improvement, however, over provision by scattered truckers, and adds accountability to the community it serves. Since providers are competing among themselves they have to provide good quality water at a fair price. Acting as a collective body, the community has a bargaining position and can act to switch providers if service standards do not meet their needs and capacity to pay.

While mobile providers in Lima could increase their productivity considerably by investing in holding tanks and neighborhood piped networks, they prefer to invest in additional trucks. A new truck cannot increase revenue as much as a holding tank or a network, but it will not expose the owner to a loss if the holding tank is expropriated by the State.

The trend suggests nonetheless that with a mildly favorable regulatory environment, SSIPs would invest in delivery systems that involve greater sunken costs and risks, but provide larger volumes of water at a better price to their clients.

Source: Solo (2003).

Common to all water SSIPs in El Salvador, as elsewhere, is the problem that there are no mechanisms to finance investments in the water sector by which public funds would subsidize or facilitate access to credit by these enterprises in recognition of their advantages in serving peri urban and/or rural areas and the poor. Since SSIPs cannot access commercial lending, it is difficult for existing ones to extend their coverage. In addition, most Salvadoran water associations face the rapid depreciation and the end of the useful life of their equipment, tanks, pumps, and networks, since existing systems are on average nine years old and most of them need urgent replacement or repair. There is also a need for more energy-efficient pumps. Finally, most associations claim that water is wasted due to the lack of meters and the presence of leaks that are not fixed.

Moreover, there is no adequate technical advice about or supervision of the water quality of most of these providers. Water associations normally use chlorination as a treatment method, but mobile providers in peri-urban areas do not treat it in most cases. Since some water sources in the country have high levels of iron and manganese, all these providers should be controlled before being considered a viable solution. In addition, control could be extended to water tariffs in order to protect consumers from being charged excessively for services rendered.

Finally, many water associations owned and run by community boards fail to provide adequate service because they lack the needed managerial and business skills. Community members are not necessarily management trained. To solve this problem some community boards have outsourced service provision while retaining ownership. In other cases, such as Paraguay, an umbrella group of water associations has been created to provide capacity- building and managerial support to members that request it.



Garbage Truck: equipment used by the large service provider
Photo from World Bank Photo Library

Solid Waste SSIPs

Solid-waste collection regional data show that coverage averages about 70 percent in large Latin American cities with populations of more than 1 million, and an estimated 50 to 70 percent in smaller cities (Arroyo, Rivas, and Lardinois 1997). Although detailed information on total country coverage is lacking, a recent study of the San Salvador metropolitan area showed that 70% of the waste generated was collected, while in the rest of the country coverage averages 50%. Specifically, coverage for poor urban areas ranges between 50 to 60% while poor rural areas are almost completely unattended with coverage as low as 2-5%. Thus, coverage is well below the regional average. The country is lagging behind in terms of disposal arrangements, as well: only 24 of the 262 municipalities disposed of their trash in adequate sanitary landfills. The rest dispose of it in open dumps that are not subject to any environmental control (RTI 2003).

continued on page 24

Paraguay

Output-based Aid in Paraguay's Water Supply Sector^a

In the late 1990s Paraguay presented the World Bank with the challenge of finding a more cost-efficient way to generate new water connections. The country's utilities ranked low in coverage levels—50 percent in urban areas and 37 percent in rural areas and small towns. The aim was to expand water coverage in the short term. After an assessment of the two state entities responsible for water provision in both urban areas (*Empresa de Servicios Sanitarios del Paraguay, Sanitary Service Enterprise of Paraguay, ESSAP*) and rural areas (*Servicio Nacional del Agua en Areas Rurales, Paraguay, Main Agency for Water Provision in Rural Areas in Paraguay, SENASA*), the country and the Bank decided to concentrate on the latter.

SENASA had a good service record and had successfully managed to create more than 1,000 Water User Associations (*Juntas o Comisiones de Agua*). Its project scheme for large rural communities was based on a strong commitment and contribution from community members. These were required to participate in building their own water system through: (a) cash contributions before and during the construction process (up to 15 percent of total costs), (b) in-kind contributions such as labor and construction materials (up to 15 percent of total costs), and (c) a loan for the 30 percent of overall construction costs to be repaid to SENASA during 10 years following the association start-up. Once the water systems were installed the associations would operate the system with SENASA's technical assistance. By 2001 SENASA had managed to build 900 water systems that provided 173,000 household connections.

Under this scheme public funds contributed to 40 percent of the system's costs in large communities and to approximately 82 percent in smaller communities (where subsidies were higher). In practice, subsidy levels were higher due to considerable delays in debt payments or because communities would not be able to disburse start-up costs. Moreover, with this cost-shared structure, coverage expansion as planned did not seem possible: to achieve SENASA's goal of 85 percent coverage by 2013, the institution needed an average of \$13 million a year. However, yearly investment budgets did not exceed \$4.3 million. With that level of investment, Paraguay would need 20 years to reach its goal.

After recognizing that neither the traditional model of water-user associations nor the water utilities were enough to expand coverage in the short term, Paraguayan officials opted to design a pilot project to tap the potential of existing and prosperous private water providers. They set up a scheme to attract small companies to rural areas to build and operate water systems. The community maintained a say in contract conditions and would still have to pay for some part of the connection charges.

^a Output-based aid refers to the provision of a public subsidy to a private operator once the service for which it was hired has been successfully provided. The subsidy should cover part of the private provider's investment costs.

Under the first pilot scheme the private operator would be chosen through a competitive bid and the winner would enter into concession contracts with SENASA and the water association. The first contract would specify how the subsidy was to be disbursed (based on the output-based model, see below), while the second one would include the system's technical specifications along with a definition of areas to serve. Service hours and rates would be agreed with the community and included in the bid conditions. Under the concession contract with the water association, the private operator would be obliged to connect all households in the service area that demanded it and were willing to pay their share of connection costs.

To guarantee that SENASA would be paying less than in the former scheme, a maximum subsidy per connection was established at \$150. Thus, if private operators agreed to all contract conditions and the proposed subsidy level, the one that came up with the lowest connection cost (to be paid by users) would win the bid. The first pilot was a success: various consortiums of builders and operators participated in it and offered acceptable connection costs for the community (between \$50 and \$67).

In view of such success SENASA started a second pilot^b with a slight change from the first one: instead of making connection costs the deciding factor on the bid, they switched it to the lowest public subsidy required per connection. In that way SENASA assumed the risk of the bid, and the maximum amount per connection that each client would pay was established beforehand and was included in the bid's clauses. This last pilot allowed communities to know exactly what their cost would be before choosing their provider.

The three water systems of the first pilot are still in operation, and the second pilot proposals are being analyzed. Community response to private sector participation has been positive given the short period of time lapsed between conception and implementation, and because the community did not have to give initial cash contributions.

If these pilot schemes prove to be successful, SENASA will have found a way to expand coverage at less than half its previous costs without sacrificing quality. Without SSIPs, the average subsidy was around \$300 and \$400 per connection. If SENASA manages to provide the same service for \$150, it will have duplicated its investment capacity with no additional investment budget.

Source: Drees-Gross, Schwartz, and Bakalian (2004).

^b Implementation of the first phase of the second pilot began in September 2004, and the second phase started in February 2005.

Current national law gives complete responsibility to the municipalities for solid-waste management and disposal. Each municipality then issues its own solid-waste regulations. No uniform regulations or laws exist at the municipal level for handling this responsibility. The lack of technical resources and economic limitations in most cases have kept municipal governments from being able to effectively meet the growing demand for waste-management services. Of the existing 262 municipalities, 184 provide solid-waste-collection services (RTI 2002). Some of them charge for service and outsource provision by hiring a mix of small, medium, and even large private providers that bring in vehicles, drivers, and waste collectors–operators, though there is no information on the exact number that do so. Thus, the service is provided in the country at different levels of coverage and quality.

Since no uniform laws or regulations exist on solid-waste collection and disposal at the municipal level, various models of collection exist. *In a sample of 30 municipalities, the study found 64 waste-collection micro enterprises*, which ranged from very small to medium sized, often with family-owned and managed operations. Single owner–operators represent one group. Operators that invest in a vehicle for garbage collection form a second group, characterized by pick-up trucks and an average of four employees. Finally, the largest of these entrepreneurs run businesses of up to 50 workers and use sophisticated contractual arrangements. All of these entrepreneurs and their workers complement their income with resources they obtain from recovering and selling recyclable materials.¹¹

Solid-waste SSIPs in El Salvador, as elsewhere, often use second-hand equipment. The smallest SSIPs have an average capital investment of \$50, consisting of a cart, a tank, and a shovel. Medium SSIPs that provide



Picking bottles for recycling in dump
Photo courtesy of Chris Jennings

service with smaller fixed-bed trucks have an average investment cost of between \$8,000 and \$10,000, and even \$2,000 for smaller trucks. Operation and maintenance for this last group can be as much as \$900 a month including salaries, gas, and vehicle maintenance.

SSIPs involved in garbage collection have different relationships with municipalities. Municipalities can take the role of a client, a competitor, or a regulator that can grant them access to intermediary or final disposal sites such as transfer stations, sanitary landfills, open dumps, and/or trash containers. Occasionally private providers can employ municipal workers to carry out any of the collection tasks, depending on contract specifications. When the municipality is a client, it can define collection areas and implement an outsourcing model that would establish a stable, secure relationship with small providers (through, for example, multiple-month or one-year contracts). The case of the city of La Paz describes such a scheme (see Box 7).

Users of end services of these providers are residences located in areas that are difficult for trucks to reach, or are businesses that need increased coverage due to their large waste production, such as restaurants, supermarkets, hotels, and shopping centers. An

¹¹ See Box 4 for an extended definition of Small Solid Waste Pickers.

Table 3: Cost Comparisons between Direct Provision and Outsourcing

Solid Waste Collection and Transportation – Service Provider	Average Cost per Ton \$	Fare (house/month) \$
Municipality	58.3	0.45-4.57
Small Service Provider – Serving Private Residents	N/d	1.15-1.70
Small Service Provider – Serving the Municipality	18.64	n/a

Source: Authors' compilation based on Henao, 2004

independent study conducted in the San Salvador metropolitan area showed that private clients of these SSIPs are in general pleased with the service and sometimes consider it more reliable than the service offered by the municipality when such service is available. In some cases, clients pay the cost of private collection in addition to the municipal fee. Residents and commerce owners have confidence in SSIP workers, especially since they work alongside the business' owner in most cases (Arroyo, Rivas, and Lardinois 1997).

The smallest solid-waste-collection SSIPs in El Salvador often service residential areas and charge the families directly per bag collected (\$0.11) or through a fixed monthly rate (\$1.15 to \$1.70). Medium-size SSIPs with pick-up trucks often service commercial users, charging \$6 per trip for up to three trips a day. When municipal governments pay the SSIPs, they either do it per number of houses served, per trip, or per weight. Private clients pay per week or every two weeks, while municipal governments can take from 30 to 90 days to pay. Payment delays have a negative impact on SSIPs since they operate with a tight cash flow. Irregularity in municipal payment for services rendered is a key problem across the country.

The impact of these SSIPs is twofold: they provide services to difficult access areas where large providers, either private or public, would not go, and they provide services at a considerably cheaper cost than that of municipal direct provision. A representative sample of Salvadoran municipalities taken from the central, north, and south regions showed that direct provision has an average cost per ton of \$58.30. If the service is provided through outsourced SSIPs, the average cost of trash collection and transportation for the municipality is around \$18.64 per ton, with a maximum registered value of \$37.84 (Table 3). In other words, a municipality can save an average of US\$39.66 per ton by contracting out SSIPs while maintaining the responsibility for service provision and quality supervision.¹²

Solid waste SSIPs have also come to represent an important economic sector in El Salvador, providing employment and income to low-skilled personnel.

Challenges Faced by Solid-Waste SSIPs

In spite of all the service advantages they provide, SSIPs have not been formally incorporated into the solid-waste-collection scheme of most Salvadoran municipalities. Thus, many of the existing SSIPs

¹² To arrive at this number, the RTI study determined the total amount of waste generated by each municipality and analyzed the financial information including all expenses incurred in the collection and transportation of solid waste. Direct costs considered include gas, vehicle maintenance, salaries, fringe benefits, uniforms, and tools. Indirect costs were a percentage of the fixed costs of municipal offices that work in urban services

operate without government permission or oversight. This happens because many public officials still favor direct municipal provision and regard SSIPs as a threat to municipal jobs. Furthermore, there is a lack of public awareness about SSIPs' competitive advantages and the role they could play in assisting municipal governments in delivering efficient collection services.

Furthermore, there is not a complete body of legislation pertaining to solid-waste management that protects SSIPs, making them vulnerable to changes in municipal policy. Some SSIPs operate under ad hoc municipal contracts that can be changed overnight, while others just do it without municipal permission at all. Their legality and stability as a

Box 7

Bolivia

La Paz Incorporation of SSIPs into its Waste-collection System

In the last decade the constitutional context in Bolivia has changed significantly. Legislation was amended to facilitate the participation of community-based organizations in the provision of public services. The Public Participation Law (*Ley de Participación Popular*) anticipated improvements in the system of oversight, control, and evaluation through giving neighborhood and regional organizations and community committees the power to monitor social services, including those provided by SSIPs. In this context, many Bolivian cities are using SSIPs within the framework of an urban public service decentralization process. These providers offer greater transparency in urban service management and increase private participation in the environmental and urban service field.

Municipal Cleaning Enterprises (*Empresas Municipales de Aseo, EMAs*) are municipal enterprises that are in charge of waste-collection services. These decentralized entities exist in cities such as La Paz and El Alto, while other cities still manage their solid waste from within the structure of the municipality. By 1996 there were solid-waste SSIPs operating in the cities of Cochabamba, La Paz, and El Alto. In Cochabamba and La Paz, SSIPs were legally recognized and had contracts with their respective EMAs. The operation in El Alto was informal and was paid directly by clients.

Nine SSIPs were responsible for waste collection in the upland mountainside areas that cover nearly 30 percent of the urban area of La Paz, with a total of 120 workers serving 247,657 inhabitants. The municipal government actively promoted the creation of these enterprises as an answer to waste-management needs in the lower-income areas of the city.

business is compromised, and so is the quality and continuity of service. This informality has serious implications for their access to financing. All of them have to rely on personal loans when necessary. Finally, these entrepreneurs often fail because they lack any administrative or management training or because they face extreme difficulties in getting the

clients to pay in time or at all. As mentioned, they operate on very tight cash flows and tend to experience big delays with payments from municipal governments. The City of La Paz represents good practice for the successful incorporation of SSIPs into the Waste-collection System (Box 7).

The topography of these areas is very irregular and made it impossible to collect waste with mechanical equipment. Service provision by manual labor required greater physical effort. SSIPs had both mechanical and manual equipment acquired through credit from the municipality and the German Agency for International Cooperation (GTZ). Some of these SSIPs were initially subcontracted by Starco Inconstruc, Ltd., a private company. However, Starco terminated its contracts with the SSIPs in 1995 and returned to provide waste-management services in the upper slopes of La Paz. This led to a reorganization of the waste-management-operations system in the city, which implied the reassignment of work zones and the establishment of nine SSIPs to serve them. In August 1995 all these SSIPs were contracted directly by the EMAs for a period of five years. They charged for service per metric ton collected and transported to the transfer station or landfill, as Starco did.

These SSIPs clean the difficult access areas of the city. This includes sweeping the streets, door-to-door collection of household waste, and transportation of the waste to the transfer station or landfill. Workers travel in pairs using carts especially designed for the slopes, and the waste is deposited at established transfer points.

On average, the nine SSIPs collect 1,675 metric tones of solid waste per month. SSIPs charge a tariff of \$21.97 per metric ton to collect the solid waste and transport it to the transfer station. SSIPs' tariff is slightly lower than the one charged by Starco.

Source: World Bank (1997).

C. Looking for a Solution

Assessment of Best-possible Options

El Salvador's case and the depicted international experiences show that SSIPs play a vital role in service provision to the poor. They also make clear that their contribution could be enhanced by adequately integrating them into an institutional and legal framework and by their services being controlled for quality. But which ones could be integrated? Under what circumstances?

SSIPs may not be the panacea for coverage expansion in all cases: some governments and policymakers prefer infrastructure services to be provided by centralized networks rather than alternative providers. Even if this position is debatable, those who favor it for *water provision* argue that building high-quality networks may be cheaper in the long run than if the network has to be upgraded several times. Economies of scale and scope attached to network supply mean that the prices of network supplies are also likely to be lower in the long run. Furthermore, they continue to dictate that an excess of SSIPs can certainly lead to an atomization of service, which in turn can give rise to problems such as a profusion of providers, which can in turn hamper regulatory activities. Others argue that decentralizing service provision to the municipal level subjects it to a relationship with local governments that has often resulted in decisions

on essentially technical issues being taken from a political standpoint, and/or in misuse of government resources and funds (Network 2004:1). *In the solid-waste-collection sector* many argue that hiring a mix of large and small providers is too cumbersome and inefficient, while outsourcing service provision through a single private operator often proves to be a more cost-efficient option than municipal direct provision.

These arguments might hold true, but if coverage expansion is a goal, then SSIPs will need to coexist with large providers. SSIPs have proved to be a good alternative so far to serve remote and difficult access areas with acceptable levels of quality, but there are trade-offs in each service provision scheme. Table 4 summarizes *best-possible and intermediate (second-best and third best)* options for each sector. The main challenges to achieving the best-possible options are

Table 4: Assessment of best possible and second-best Options for Water Provision and Solid Waste Collection

	Water Provision	Solid Waste
Urban / Peri-Urban Areas	<p>Best-possible option: Population served by main network (public or private).</p> <p>Second-best option: provision by small providers through a network connection. This is an option only if groundwater is available and is of good quality.</p> <p>Third Best Option: Water provided in tanks with a single operator in charge of the distribution (Lima Case, Box 5).</p>	<p>Best-possible option: Municipal management that outsources to the private sector with different combinations of medium and small service providers (La Paz Case, Box 7).</p> <p>Second-best option: Municipal direct provision</p> <p>Third Best Option: Establishment of drop-off stations that are emptied regularly (either private or public).</p>
Rural Areas	<p>Best-possible option: Water Association. Outsourced management and operation. (Paraguay Case, Box 5).</p> <p>Second-best option: Water User Association. Community management and operation.</p>	<p>Best-possible option: Drop-off points that are collected and disposed of properly.</p> <p>Second-best option: Individual solutions to waste management (open air-dumps, incineration).</p>

Source: Authors' compilation based on Henao, 2004

related to investment—how to pay for capital costs and maintenance—and to management, since not all municipalities or rural communities know how to operate infrastructure and urban services. Criteria for selection of the best option are first based on the provider's capacity to serve the poor, and then on its capacity to offer the lowest cost. Water quality is a basic requirement for all proposed options in the first column of Table 4.

For water provision in urban areas it is cheaper and more efficient in the long run to build high-quality networks linked to the main provider. Since economies of scale tend to apply, the cost of the water supplied is also likely to be lower in the long run, and quality standards can be more easily supervised. Where network connections are not a possibility, smaller networks served by independent entrepreneurs are the next-best option on condition that their service has adequate levels of quality, coverage, and continuity,



Set up pipes for the installation network
 Photo from World Bank Photo Library

and that it is affordable to its target population. Finally, in the absence of a network supply, tanked water is a valid option despite being more expensive. This last option presents an additional quality concern since tanked water has the potential to be more of a health hazard than water provided from piped networks, due to its exposure. The case of urban slums in Lima, Peru depicts how, in view of the existing regulatory risks implied in installing a piped network, a second-best solution with tanks was implemented (Box 5).

For water provision in rural areas, water associations have proven to be best option. Large economies of scale do not apply in these areas since utilities do not find it profitable to extend their networks to remote and scattered areas. When municipal direct provision fails, the alternatives are either private

piped systems or non-profit community associations that run the business. These associations represent an improvement over informal network providers, as has been shown through the experience of El Salvador and Paraguay's case, described in Box 6.

For solid-waste collection in urban areas, a concession mix for both large and small collection services is the recommended option. Direct provision is highly discouraged due to its higher costs. But concessions to large providers can be seen as only a partial solution, since their equipment specifications are inadequate to collect solid waste in peri-urban areas. Also, since these areas tend to be poor, large concessionaires lack the incentives to provide service there when the service is directly paid by the client. SSIPs could fill this gap because: (a) they can adapt their equipment and working methods to fit clients' needs, and can reach previously underserved areas with difficult topographies, security issues, or which were simply inadequate for the equipment specifications of larger providers; (b) they can provide the service at a low cost given the use of cheaper technologies; (c) SSIPs can favor community participation and civil society control over service provision, and can also play a role in public environmental education by introducing separation at source and fostering recycling practices among their clients. The case of the City of La Paz depicts how waste-collection services can be adequately and efficiently provided by hiring one large provider for planned neighborhoods and nine SSIPs to work in informal neighborhoods with difficult topography and no road access (see Box 7).

Rural areas have traditionally been left out of collection routes because they are located in remote areas and predominantly produce organic trash, but they could have some arrangement for pick-up and delivery. Until now the trend has been for each rural household to have its own disposal solution, such as burying or burning trash, causing severe air pollution and other

health hazards. Recent developments and the increased incoming remittances from relatives living and working outside of El Salvador have considerably changed consumption patterns in rural areas in the region, and the production of organic waste has decreased while the production of other kinds of waste has increased. Thus, the recommended solution is to establish a pick-up-and-delivery process by which the municipality can collect the trash from these areas and dispose of it properly. SSIPs could provide this service if given the right incentives, and could do it at a lower cost than a large provider. Under this option, landownership of the drop-off and pick-up site tends to be an issue. Municipal governments serving or outsourcing services in rural areas should take this fact into consideration.

D. Recommendations

Incorporating SSIPs into the Water Sector and Solid-waste-collection System in El Salvador

The local private sector

has demonstrated its ability and interest in the development and management of water supply and waste collection services. It has also made significant investments in water provision systems and solid waste collection equipment.

Thus, to incorporate SSIPs in both water provision and solid-waste collection, the government and policymakers could promote the development of an institutional, legal, and regulatory framework that would guarantee SSIPs stability and continuity. This could be achieved through the establishment of models of private participation, along with contract types and regulations. These models should allow for the coexistence of all types of providers, profit and not-for-profit alike, and should not be tailored to the capacities of large companies or private monopolies. Furthermore, by establishing a clear policy and regulatory framework for SSIPs the government could free up scarce public financing for less attractive segments of the market and reduce costs while improving prices for consumers.

Specifically for water provision, Salvadoran authorities could strive to extend main network connections in the short term to cover the urban poor in peri-urban areas. In the meantime, they could have a strategy

to serve this population that could include small providers when they represent the best available option. In rural areas they could strive to support and expand water associations. To do so governments and policymakers would need to consider:

- *Fostering the professionalization of water associations and water-user associations and outsourcing municipal services to SSIPs.* In view of the success of water associations, training and turning water association administrators into professionals would allow for greater levels of efficiency in management and maintenance and operation of the systems under their charge. It could also provide a base of independent professionals that would be able to carry out management leasing or concessionary contracts and institutionalize contractual models of private participation in the delivery of water services through SSIPs. Many urban developers in El Salvador frequently invest in the construction

of systems and then wait for ANDA to take over administration, operation and maintenance, because these activities do not correspond to the normal scope of their businesses. ANDA or the corresponding municipalities could turn these systems over to professional administrators through contractual management, leasing, and concession models.

- *Promoting the expansion of a best-service-provision model to underserved rural areas.* Both FISDL and ANDA could consider opening lending windows for water and water-user associations. SSIPs can help fill the gap in private financing of infrastructure by serving marginal urban communities, peri-urban and rural areas. These are often the most costly clients to serve for large investors and the last to receive connections. Along this line ANDA could explore subsidy schemes to facilitate their expansion. Paraguay's case, depicted in Box 6, could serve as an example.
- *Including alternatives for financing, saving, and a tariff-setting strategy.* FISDL, ANDA, and the Municipalities could execute cooperative agreements with the water and water-user associations to support the expansion of macro and micro metering and the introduction of appropriate fee systems to control demand and avoid water wastage. The savings that can be expected from these measures combined with some additional measures for leakage control would allow expanding coverage without additional investment.
- *Doing quality training, testing, and control.* Public authorities should support efforts to improve the quality of water, protect watersheds, and minimize environmental impacts. They could provide technical assistance as needed along with establishing control systems. A policy to support SSIPs cannot exclude quality supervision and control.

Specifically for SSIPs in waste collection:

FISDL and Municipal governments could capitalize on SSIPs' competitive advantages by outsourcing services while maintaining the responsibility for waste collection and an oversight function. Cost savings achieved by SSIP participation would allow municipalities to reduce subsidies while expanding service coverage in the short run. In the long run, municipal investments could be directed to finding final disposition alternatives such as recycling, composting, or creating sanitary landfills. More specifically, FISDL and Municipalities could:

- *Discourage municipal investments directed at installing or increasing capacity for direct delivery of solid-waste-collection services.* In most cases purchasing new equipment for collection and transportation services generates the following inconveniences: (a) it leaves the municipalities tied to an inefficient management model marked by the maintenance and operation problems and costs; (b) it makes more difficult the management of personnel, financial costs, and operational risks; and (c) it generates confusion between the functions of control and service delivery and very high costs of operation and maintenance and costs for the lifecycle of the equipment. An exception to this could be the case of municipalities that invest in new equipment in order to lease it to the private sector. If such an option is the most cost-efficient, it could be adopted.
- *Limit SSIP participation to what they do best.* SSIPs in solid-waste management should not be expected to provide all the solid-waste-management services of a city. SSIPs are well suited to undertake all those tasks that have small or negligible economies of scale and that do not require expensive equipment such as primary collection, street sweeping, waste recovery, and separation at the source. The current trend in El Salvador is toward a mixed system of small

and larger enterprises working together with municipalities. One such arrangement is the use of SSIPs for primary collection in those parts of the city with difficult access, and a larger contractor for other areas and/or to transport the waste to the disposal site. This is just one of a wide range of possible combinations (Haan, Coad, and Lardinois1998:19).

- *Incorporate the rural sector into an integrated solid-waste-management system.* Due to the impact of remittances on the consumption habits of rural households in El Salvador, there is an apparent change in the composition of solid waste that increasingly poses environmental risks for the water sources. Consumption habits of rural households have changed, and the traditional models of waste-management incinerating and burying organic waste could be adapted to include integrated management of other solid wastes, including the separation of hazardous and recyclable materials.
- *Support SSIPs in the separation, recuperation, and pre-recycling of plastics and other materials.* FISDL and Municipalities could support the diversification of economic activities of SSIPs in order to consolidate advances in the productive chain of solid-waste management. Facilitating access to credit could be part of that support.

References

- J. Arroyo, F. Rivas, and I. Lardinois. IPES, ACEPSA, WASTE. 1997. "Solid Waste Management in Latin America; The Role of Micro and Small Enterprises and Cooperatives." Urban Waste Series 5, Lima, Punto y Coma Publishing Co.
- DIGESTYC (Dirección General de Estadística y Censos). 2004. "Encuesta de Hogares de Propósitos Múltiples."
- Drees-Gross, Franz, Jordan Schwartz, and Alex Bakalian. 2004. "Lessons Learned from a Pilot Project in Paraguay." FPSI. Washington, D.C.: World Bank, June.
- Haan, H. C., A. Coad, and I. Lardinois. GTZ, ILO, SKAT, WASTE. 1998. "Involving Micro and Small Enterprises, Guidelines for Municipal Managers." Turin: International Training Center of the ILO.
- Henao, Marino. 2004. "Consultancy to Analyze the Comparative Advantages and Potential of Small Providers of Infrastructure Services in El Salvador." (Original in Spanish: "Consultoría para Analizar las Ventajas Comparativas y el Potencial de los Pequeños Proveedores de Infraestructura en El Salvador.") San Salvador: Research Triangle Institute, October. (Also see RTI citations below.)
- Kariuki, Mukami, and Jordan Schwartz. 2005. "Small Scale Private Providers of Water Supply and Electricity, a Review of Incidence, Structure, Pricing and Operating Characteristics." Draft. Washington D.C.: World Bank-Energy and Water Department/World Bank-Netherlands Water Partnership/Public Private Infrastructure Advisory Facility, July.
- Network for Cooperation in Integrated Water Resource Management for Sustainable Development in Latin America and the Caribbean. 2004. Circular No. 20, September.
- RTI (Research Triangle Institute). 1998a. "Encuesta de Hogares de Propósitos Múltiples." Dirección General de Estadística y Censos (DIGESTYC), San Salvador. (Cited in Henao 2004.)
- _____. 1998b. UCA-FIADES. "Investigación Aplicada sobre el Impacto Ambiental de la Contaminación del Agua y Sensibilización Social Sobre la Problemática." San Salvador. (Cited in Henao 2004.)
- _____. 2000. Gómez, Bernardo. "Informe sobre Políticas Financieras Sectoriales: El Salvador Sub-Sector Agua Potable y Saneamiento, 2000." EHP, San Salvador. (Cited in Henao 2004.)
- _____. 2002. Censo en Recolección y Tratamiento de Residuos Sólidos, Llevado a Cabo por la Corporación de Municipalidades de la Republica del Salvador. San Salvador. (Cited in Henao 2004.)
- _____. 2003. Ayuda Memoria del Taller Sobre Recolección y Tratamiento de Residuos Sólidos. Corporación de Municipalidades de la Republica del Salvador. (Cited in Henao 2004.)
- _____. 2003. "The Millennium Development Goals and Investment Needs for Latin America and the Caribbean." International Conference for Financing Water and Sanitation Services, Options and Constraints." Inter-American Development Bank, November. (Cited in Henao 2004.)
- Solo, Tova. FPSI, EWD. 2003. "Independent Water Entrepreneurs in Latin America; The Other Private Sector in Water Services." Lima, Biblos, May.
- WHO/UNICEF (World Health Organization/United Nations Children's Fund). 2004. "Meeting the MDG Drinking Water and Sanitation Target: A Mid-term Assessment of Progress." Joint Monitoring Programme for Water Supply and Sanitation.
- World Bank. 1997. "Solid Waste Management in Latin America." Washington, D.C.
- _____. 2004a. *Quick Reference Guide to the World Development Indicators, 2004 Little Data Book*. Washington, D.C.
- _____. 2004b. "The Urban Poor in Latin America." Report No. 30465. Washington, D.C., November.





WORLD BANK

World Bank
1818 H Street, NW
Washington, D.C. 20433
Tels: +1 (202) 473 2710 / 473-7229
Email: whelpdesk@worldbank.org



PPIAF

PUBLIC-PRIVATE INFRASTRUCTURE ADVISORY FACILITY

1818 H Street, N.W.
Washington, D.C. 20433
Phone: +1 (202) 458 5588
Fax: +1 (202) 522-7466
Email: info@ppiaf.org
Website: <http://www.ppiaf.org>