

MANAGEMENT MODELS FOR SMALL TOWNS

Community Water Board in Itagua, Paraguay

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Abstract

This case study describes a successful approach for providing water supply services in Itagua, a town located 25 kilometers east of Paraguay's capital of Asuncion, using a community-based water board model. The model, referred to as the *junta model*, is used in Paraguay primarily for communities with fewer than 4,000 people. It is based on a board of directors elected by a general assembly of water users. Originally established in 1974 when the population of Itagua was 2,975, the junta now serves the entire urban population of 25,000 with water supply services and has a full-time staff of 23 employees. The junta is completely separate from the municipality, administratively and legally, although one of the five board members is a municipal representative.

By commonly accepted standards, the junta is highly successful. Itagua is the only town of comparable size in Paraguay that has complete coverage. Service is provided 24 hours per day, 100% of the connections are metered, and unaccounted-for water is minimal. User fees cover all recurrent costs, depreciation, and debt service, and generate excess revenues to finance system expansion. Although no wastewater services are provided, the junta is considering ways to address this pressing issue.

As a municipality, Itagua provides a very interesting application of the water board model, which is most often used for rural communities. The case study discusses the factors that need to be addressed for the model to be sustained and replicated in other municipalities in Paraguay. In particular, the example demonstrates how a single-minded focus on financial self-sufficiency, community involvement, and quality services can achieve superior results. Despite the current uncertainty about the future of the water and sanitation sector in Paraguay, this example offers powerful evidence of what local control can accomplish.

1. Background and Context

Overview of the WS&S Sector

Paraguay lags behind other South American countries in providing potable water to its population. Although it has abundant surface and subsurface water resources, estimates indicate that only 37 to 50% of the population has access to potable water, and a much smaller portion (around 20%) has access to sanitation services (PAHO, 1998 figures).

The water supply and sanitation (WS&S) sector in Paraguay is characterized by centralization in an institutional and legal sense. Responsibility for provision of potable water and sanitation in Paraguay lies in the hands of two central government-managed institutions: the Sanitary Works Company (CORPOSANA) and the National Environmental Health Service (SENASA). CORPOSANA has had the legal mandate since 1966 to serve communities with populations over 4,000 people. This corporation falls under the jurisdiction of the Ministry of Interior whose primary function is internal security and managing the national police force. SENASA is an agency of the Ministry of Health and Social Welfare which serves communities with populations less than 4,000 people, primarily in rural areas.

Both these institutions provide only minimal coverage of potable water and sanitation. It is estimated that CORPOSANA serves 230,000 connections, or approximately 25% of the Paraguayan population. CORPOSANA presently provides services to only 20 of the 59 municipalities that technically and legally fall under its jurisdiction. Although CORPOSANA has traditionally been a recipient of large loans from bilateral and multilateral lending agencies, recently the World Bank has cancelled loans with the company due to poor management and lack of sector reform. At the same time the Inter-American Development Bank (IDB) has supported the establishment of a new regulatory body that would effectively decentralize and/or privatize services.

Although Paraguayan agencies do not track investment in the WS&S sector on a yearly basis, an analysis done in 1998 by the Ministry of Health with the help of the Pan American Health Organization and IDB gives some indication of the investment sources and inherent problems in financing expansion of the system by the public sector agencies. The report indicates that the greatest portion of investment capital in the past 10 years has come from multilateral and private international banks.

CORPOSANA has outstanding debt of over \$270 million to be paid over the next 10 years. Paraguayan government cofinancing or counterpart funding for these capital investments has only been around \$30 million. CORPOSANA is not able to take on more debt to expand the service since the investment projects it already has are not being carried out as planned with the lending agencies. Capital investment projects have been poorly executed. In 1997 only 20% of projects were executed relative to the planned investment for that year. In 1993 the levels of project implementation were at 80%.

In addition to these failures in providing new infrastructure, CORPOSANA bills less than half (45%) of the water it produces. Estimates indicate that an investment of more than \$800 million in this sector is needed to provide at least 80% coverage of potable water and 60% of wastewater collection and treatment. CORPOSANA clearly is not able to provide for this investment from its own income or loans. As a result, other private sector players have stepped in to provide services and the Government of Paraguay has embarked on a strategy to reform the WS&S sector to stimulate more investment.

The inability of the public sector to provide water to a large portion of the Paraguayan population has fostered the growth of an informal sector. These private sector vendors are

called *aguateros*, numbering around 400. These are unregulated businesses, selling water primarily in the greater Asuncion metropolitan area. They vary in size from small horse-drawn carts with 200-liter drums to companies that distribute water by PVC pipe to up to 2,000 connections with metering systems and several deep wells.

Connection fees and the sale of water cover the capital costs of *aguateros* for drilling wells and extending the systems. Although these providers have been quite successful at expanding services because of the great demand for water, they continue to be unregulated and informal and therefore have limited access to reasonable financing from commercial or public development banks.

In rural areas of Paraguay, *Juntas de Saneamiento* provide potable water. These juntas are community-based water service providers that function in a manner similar to cooperatives or private nonprofit associations. A board, elected by all the water users, manages the junta. SENASA, thanks primarily to a series of successive World Bank loans, provides seed money to establish the juntas. This money is provided partially as a grant and partially as a loan that must be returned to SENASA through collection of water fees. These funds play an important role in helping the juntas get off to a good start.

Given the great number of juntas (around 600) and the weak institutional capacity of SENASA, not all juntas are well managed or have the capacity to repay loans. In any case, these juntas have been the most successful models in Paraguay for providing water to small communities. They have been able to increase coverage from 11% in 1993 to almost 30% in 1999. Donors such as the World Bank consider the model important and presently are providing SENASA with its fourth loan for rural water supply.

In summary, the private sector *aguateros* and the *Juntas de Saneamiento* provide more than half of the potable water distributed in the country. Table 1 summarizes the estimated number of connections provided by each category of provider.

Table 1: Estimated Number of Connections by Provider

Provider	No. of Connections	Population Served (est.)	Percentage of Total Served
Aguateros	115,000	575,000	22
SENASA	180,000	900,000	34
CORPOSANA	230,000	1,150,000	44
TOTAL	525,000	2,625,000	100

Local government involvement in the provision of WS&S services has been limited. Although the constitution, drafted in 1992, states explicitly that local governments (municipal and departmental) are to be the agents for development of the country, eight years later, only small advances have occurred. Neither the financial nor human capacity of municipalities has improved to a great extent with the exception of the municipalities

in the Asuncion metropolitan area, where a stronger tax base allows them to provide certain services.

Municipalities in Paraguay are autonomous according to Article 166 of the National Constitution. Article 168 of the same document indicates that municipalities have the right to provide services of several types, including health services, sanitation, and environmental improvement. In reality, Paraguay does not have a tradition of strong municipal management or local administration and provision of services. Previously, dictatorial regimes had a policy of centralizing all matters pertaining to development in one or more ministries subject to the Executive Branch of government. Paving of urban streets and, to a certain extent, garbage collection have been the only important investment and services that municipalities have provided

Departmental governments (roughly equivalent to provinces or states) were created under the 1992 constitution, and the governors of these departments were to represent the Executive Branch of government. However, since they are elected positions, the governors may come from the ruling party or opposition parties. This creates a somewhat unusual situation for central government ministries and agencies. Programs and funds are only minimally transferred for management by the state. Budgets allocated directly to the departmental governments by the Treasury are small, and other funds legally assigned to them (including a percentage of lottery and real property taxes) are not effectively transferred. Departmental governments therefore have not become important agents for decentralization of central government services and public investment.

With assistance from the IDB, the Government of Paraguay has recently passed a new law that will result in the reform of the WS&S sector. The objectives of the law are to provide a regulatory framework to guarantee the provision of services, promote the expansion of services, regulate and protect the rights of users, regulate those who provide services, and protect public health and the environment. Although the law does not specify the changes in store for CORPOSANA, the general guidelines of the reform are clear:

- Establish a regulatory body (ERSSAN) that will provide overall regulation and grant concessions and permits for providing services
- Afford greater involvement of the private sector in service provision and building infrastructure
- Provide for greater participation of municipal and department governments

According to this law, signed on November 2, 2000, the central government retains the primary right to provide services rather than making it an inherent right of local governments. ERSSAN is responsible to the Executive Branch and has the authority to grant concessions, thus making true decentralization of WS&S services difficult.

Municipal Provision of WS&S Services in Itagua

Itagua has been able to overcome the political and financial obstacles that have plagued Paraguay for years, and as a result has become one of the few urban centers in Paraguay with virtually complete potable water coverage. This has occurred through the innovative application of the community-based junta model of water provision to a medium-sized city rather than a small rural population.

Table 2 provides details on population and basic services in Itagua according to the 1992 national census.

Table 2: Itagua Basic Data for 1992*

Total population	37,664
Population under 15 years old	37.7%
Percent of population in agriculture	16.4%
Total number of households	8,162
Households with electricity	96.7%
Households with drinking water	25.3%
Households with garbage collection	14.2%
Households with sanitation	36.5%

*Data covers entire municipality (rural and urban portions)

In 2000, the total population is estimated to be 55,000, and the population served with drinking water has increased to 42%. According to the 1992 census, 51% of the population is urban; therefore, Itagua has 91% water coverage for its urban population. The average coverage for urban areas in Paraguay is 60%, according to a 1998 PAHO study.

As the previous table indicates, a significant portion of Itagua's population is under the age of 15. This fact highlights the importance of potable water given that one of Paraguay's main health problems is child morbidity associated with poor quality drinking water. Intestinal parasites and diarrheal diseases follow in importance. Potable water provision has improved substantially since the last census; however, the adequate treatment and disposal of wastewater and garbage remain problems.

In the past, Itagua's economy was based on light industry and traditional handicrafts. In recent years the recession has shut many of these industries down, and tourism, which drives the handicraft business, has diminished, partly because of Paraguay's political instability. Today Itagua and several other cities within a 30-kilometer radius of Asuncion are "bedroom" cities where housing is more affordable for working class families who commute to Asuncion each day.

Itagua presently stands out in its ability to provide within the past two decades almost complete potable water coverage to its urban population. Typically, urban areas with a higher level of resources average 60% coverage. The Itagua junta also has provided water to two nearby rural districts and even to a small community of summer residences several

kilometers across Ypacarai Lake. According to 1980 SENASA data, the junta system was designed for a population of 2,975, with the potential to provide water for 5,210 people. By 1999 the system had 4,691 connections serving 23,455 people.

In addition to providing virtually complete coverage, the junta has achieved this while remaining in sound financial condition. Over the past three years it has had a positive cash flow, and in 1998, it closed the balance sheets with excess revenues of over US\$35,000. The excess funds generated have permitted the junta to improve customer service with a recently inaugurated office building and repair shop. Adequate space is provided for the administrative offices, customer complaints, and payments. For a reasonable fee, water users also can rent the new social hall. Several technical training programs have been offered in cooperation with government training agencies. The junta is also honoring all its loan commitments with SENASA and is repaying systematically. Thanks to this sound financial grounding, the junta is studying whether it will branch off into wastewater treatment and garbage collection.

Itagua's junta stands out among the approximately 600 juntas in Paraguay because of its size and financial stability. It is somewhat of an anomaly, however, given that it was originally conceived to provide water to a small community of 3,000 people. Over the years it has grown along with the town of Itagua. Only a few examples of juntas of this size have emerged over the years (mostly in the Central Department). Juntas continue to be expected to serve smaller populations, and according to the law, they are considered preferential holders of permits and allowed a maximum of 2,000 connections. Because of a clause that allows juntas to exceed this number, it is expected that large juntas will be granted permits and allowed to continue operation.

Donor assistance has become important in Itagua since the junta developed a reputation as a strong organization and a model for water provision in Paraguay. That reputation has attracted both the IDB and the World Bank in providing capital and collateral for loans to extend water services and provide other services such as wastewater collection and treatment.

The general view of the junta administration towards donors is a positive one. The main priority is technical assistance in designing and investing in a new area the juntas know little about—wastewater collection and treatment. The junta is ready to expand into this area and the donor community has offered assistance. This assistance comes primarily through an IDB program (PR-0118) for basic sanitation services for small communities. Under the IDB program the junta would receive 30% of the capital costs as a grant, 10% as a soft loan, and 60% financed through a private sector loan at commercial rates. The junta has not yet fully analyzed whether to accept the private sector loan.

Another aspect of donor assistance that is less advantageous is the fact that IDB and World Bank loans or other assistance programs have to be channeled through SENASA, which delays action and inserts undue bureaucracy into the process. The junta also recognizes that a government agency's political guidance of funds towards other juntas limits its access to donor programs that offered more generous financial terms. In

addition, the process of design and implementation of donor-funded projects is not as participatory as the junta would like. Neither SENASA nor the donors provide much information or feedback on the state of the design of their projects. Generally donor missions briefly visit the project for data collection and then they are not heard from for a long time.

2. Scope of Services Provided

The services provided by the junta are presently limited to the provision of potable water. The water is provided solely from groundwater sources that are abundant and of high quality located in the deep aquifers under the municipality. The 4,691 connections receive their water from five deep wells that pump between 30 to 80 m³ per hour. The water supply of the junta has grown from pumping one well at 30 m³/hour of water in 1974 to two wells pumping 88 m³/hour in 1982. By 1999, 23,455 people were served from a total of five wells producing over 250 m³/hour. Water production capacity and expansion of the Itagua system are based on an estimated use of 130 liters per inhabitant per day. Having a repair crew of full-time employees of the junta on call 24 hours a day ensures continuity of services.

The water is chlorinated upon distribution from the elevated cement or metallic tanks where it is stored. Storage capacity varies from 60 m³ to 300 m³. The junta has planned the construction of its tanks according to needs projected a few years in advance. A new 250 m³ water tank is currently under construction and will cover the needs of Itagua for several more years.

Wells and pumps are strategically placed based on a complete topographical survey performed by the junta. Water is distributed by gravity to all areas except one small pumping station with a 5,000 liter tank, which provides water to the highest point in town on the main road. Water is distributed through 141 kilometers of flexible PVC pipe sunk into the roads at a depth of approximately 80 cm. The pipes are put in the ground at what should be an adequate depth, but the municipality maintains unpaved roads by scraping down the surface of the road. Over time this practice exposes the pipe and causes leaks in the system. Pipe mains of up to 160 mm are used and household distribution is through ½ inch or ¾ inch pipe. Water is metered at each house with accurate mechanical meters made in Brazil.

The system is growing by approximately 165 connections per year. This figure once was as much as 300 to 400 connections per year, but it has decreased now that the urban area has almost complete coverage. Currently, junta employees put connections in the ground and into the houses. In previous years, when whole neighborhoods were connected, these services were contracted out to private firms.

Wastewater collection is not presently provided in Itagua. Neither the municipality nor the junta has implemented a collection system for the city. This is a pressing issue, however, as the city continues to grow, and the junta would like to find away to provide

wastewater services. Wastewater has also become a big issue in recent years because it is the most important source of pollution to the Ypacarai Lake. Itagua figures prominently as one of the larger cities in the lake watershed. Cleaning up the lake is a priority for the government and the populace because of the lake’s importance for tourism. Efforts to improve the quality of the lake water through implementation of collection systems and treatment plants have been limited to experimental units installed in small industrial plants and other municipalities in the lake basin.

3. Management and Organization

One of the outstanding characteristics of the Itagua junta is the professional and technical staff that keeps the system operating and financially sound. Such professional management is not the norm because many juntas are so weak administratively and financially they cannot effectively operate the water systems. Often the boards of the juntas must perform all the administrative functions on a pro-bono basis.

The Itagua junta presently has 23 full-time employees: 10 administrative and 13 in operations. Figure 1 shows the general organization of the junta.

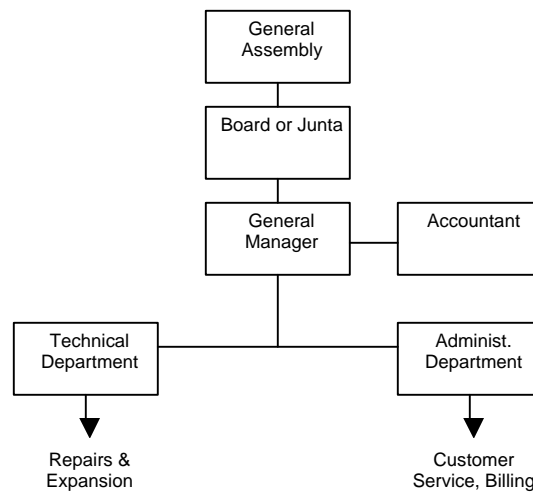


Figure 1. Organization Chart of Junta

The municipality of Itagua, according to the junta bylaws, has one representative on the board. This municipal representative has the specific task of coordinating all actions of the junta that affect municipal property and interest. This representative has generally been effective in securing rights-of-way, coordinating street closures, and moving paperwork through the municipal system for the junta. In one case a junta member went on to become mayor of the city. It is possible that a position in the junta can help project a member politically, but the makeup of the present board seems politically diverse and apolitical.

The General Assembly of water users, which is the highest level of authority under the junta model, meets annually to review the operations during the past year, review the board's performance, and elect new board members. The General Assembly is essentially what makes this a community-based organization. It has the power to change bylaws, approve capital investment, and direct the general policies of the organization.

The board is the governing body of the junta and is elected by the General Assembly. It is composed of five members elected for two-year terms; half of the members are elected at each annual assembly. This mechanism tries to ensure that no single board completely controls the operations of the junta for more than a year, although re-election is permitted. One of the members is a municipal representative selected by the mayor. Two board members are controllers that oversee the financial management of the junta.

The junta model allows two levels of responsiveness to consumers. At one level the consumer is ultimately responsible for how good the service he or she receives is. During board elections in the General Assembly of water users, consumers have the opportunity to select those best qualified to run the system. In reality, however, the level of participation in the assemblies is very low compared with the total number of connections/users (average attendance is 250 out of potentially 4,691 voters). Most consumers voice their complaints directly to the junta's professional management. The junta also has several contacts in each neighborhood who provide management with information on the state of the system. All complaints and damages are responded to rapidly to minimize water loss, and repair teams are available 24 hours a day, for which they are paid overtime if needed as required by local labor laws.

4. Financing and Cost Recovery

The junta sustains and expands its operations based on the collection of fees from consumers for their connection to the system and their metered use of the potable water provided. To establish a connection, a user must present a request to the junta. Upon approval, the user data is entered into the computerized billing system and a connection is established. Meters with ½ inch outlets are used for users who consume less than 10 m³ per month, while those with ¾ inch outlets are installed in homes with 20 to 30 m³ consumption or commercial/industrial connections that must pay for a minimum of 22 or 30 m³. Tables 3 describes the tariff structure for the junta.

Connection costs are \$114.29 and several payment plans are available. Payment in full is discounted, but those who pay in 3, 6, or 12 installments pay 5%, 10%, or 20% more, respectively, for the connection.

The cost of the basic water service provided by the junta is approximately \$0.29 per m³. This cost is slightly higher than the CORPOSANA rate for low-income residential connections (\$0.19 per m³) but lower than its highest residential rate (\$0.31 per m³). The

junta tariffs are similar to those charged by other *aguateros* and juntas throughout Paraguay.

Table 3: Tariff Structure

Category	Meter Size	m ³ /Month	Basic Monthly Fee (US\$)	Excess Use Cost/m ³
Domestic	½ inch	10	2.86	0.34
Domestic	½ inch	20	5.72	0.34
Domestic	¾ inch	22	6.29	0.34
Domestic	¾ inch	30	8.57	0.34
Commercial	¾ inch	22	11.43	0.43
Commercial	¾ inch	30	15.72	0.43
Industrial	¾ inch	30	24.29	0.86

Note: A basic fee is charged per month for each service category. Once consumption has passed the allotted amount of water for the category, the cost of each cubic meter extra is added to the basic bill.

Rates are established based on a cost analysis for the provision of the service, maintenance, growth, and cash reserves needed. The junta establishes tariffs. The staff members and administrators are accountable to the water users at the annual General Assembly meetings; tariff increases are also approved at those meetings.

Financing for capital investment has largely been provided from outside sources. Investment for the first well and basic system was provided by a loan from SENASA and the Municipal Development Institute in 1975 with some assistance from a local private company, the municipality, and local citizens. Subsequently, under successive SENASA projects funded by the World Bank, the junta acceded to several loans for expansion of the system. The terms most recently obtained on the World Bank loans have been 60- to 120-month repayment periods with a 22% annual interest rate in local currency. These terms are very convenient relative to commercial rates that rarely extend beyond five years and exceed this interest rate by several points.

Thanks to the junta members' professional management and oversight, expansion and investment have continued in this manner. Over the past four years the junta has experienced a net profit after including depreciation, operating costs, and debt service (for the SENASA-World Bank loan). Future expansion into other services such as wastewater will not be possible, however, if the junta has to rely entirely on cash reserves. The junta hopes that multilateral donors such as the IDB loan PR-0118 for small communities will help fund these investments.

5. Legal and Regulatory Framework

The "General law on the regulatory and tariff framework for the provision of potable water and sanitation public services for the Republic of Paraguay" was signed by the

President of Paraguay on November 2, 2000. Within 90 days of that date, the members of the regulatory committee of ERRSAN must be named. The terms of the law become effective the day after the establishment of the regulatory committee.

During the study of the law by the Paraguayan Congress some of the most contentious issues in the draft related to the role of the municipalities, the rights of the *aguateros*, and the role of the juntas. These issues have been addressed to some extent in the final version of the law, but perhaps not to the complete satisfaction of all affected parties.

The new law addresses the issue of the role of municipalities and departmental governments by stating that yet another new law must be promulgated that regulates their role and the terms under which they may operate. This indicates that it will be some time before the municipalities are allowed to provide potable water and wastewater collection through concessions or other means. These local governments will have an oversight role through representation on the regulatory committee. One regulatory committee member is to be proposed (although formally nominated by the Executive) by the intermunicipal coordination organization (OPACI) and one representative of the Governors' Council of a total of five members on the committee. Article 20 indicates that where there is an issue of "transcendence" for a local government, they must be invited to the session of the regulatory committee at which they discuss the issue. The representatives of local government have a voice but not a vote on the committee. Examples are provided in the law of what are important issues. These include problems in quality of services provided, expansion of services, and changes in tariffs. The law leaves open the possibility of other issues being considered important, and any decision taken without participation of the local government is considered null and void. Clearly the new law does not envision a strong role for the municipalities, leaving the decision-making for service provision to a centralized agency.

Water providers such as *aguateros* had argued throughout the preparatory process that the law was confiscatory because they were only given 5 years to operate before having to hand over all their infrastructure to the government. After this time new permits would be publicly bid. Many of the providers have argued that they have not fully recovered their investments. Others are in a problematic situation because they reside on the property that houses the wells and pumping equipment. Under the final law their permits have been extended to 10 years after which they revert to government ownership.

Juntas are considered under article 28 of the law as preferential holders of permits. They can be authorized to operate without a public bid, but the law limits permits to 2000 connections. There is a clause, however, that states that they may exceed this number during their permit period without penalty. It is expected that large juntas such as Itagua's will be granted permits and allowed to continue operation under this wording of the law.

Under the new law SENASA no longer has regulatory and supervisory roles. SENASA will "promote, execute infrastructure works, and provide assistance in organization, administration and technical matters for populations equal to or less than 10,000

inhabitants, either rural or urban.” The populations served under these terms by SENASA are permitted to grow in the same proportion as the Paraguayan population grows.

Because Itagua uses the junta model, it has always been under the legal mandate of SENASA, which was created in 1972. Historically, SENASA promoted the creation of juntas throughout the country in communities with populations of 4,000 or less. In practice, SENASA helped start juntas in communities larger than its mandate, driven by the demands of citizens and/or politicians for potable water that CORPOSANA has not been able to provide. Since many municipalities have rural areas within their territory, there has always been some overlap to areas theoretically served by SENASA and CORPOSANA. Determining what constitutes a community of more or less than 4,000 people is sometimes difficult.

In practical terms SENASA has had three main functions in relation to the juntas: financing, oversight, and quality control. Regarding financing, previous sections have explained SENASA’s role in providing loans to the juntas primarily through bilateral and multilateral institutions. In addition to the financial role, SENASA plays a major part in solving problems and conflicts that arise from the management or mismanagement of juntas. A SENASA representative may be present at annual General Assembly meetings; however, in practice this may not happen because of SENASA’s lack of human and financial resources. SENASA may intervene in juntas that are grossly mismanaged and find some way to put these organizations back on track. The third area in which SENASA has intervened is in establishing the quality of potable water provided by juntas and *aguateros*. The system for controlling water quality is weak and does not cover all providers adequately. Municipalities have established some testing regimes of their own to supplement what little SENASA may provide. Legally SENASA has also been the principal pollution control agency in Paraguay, determining permissible discharge levels for wastewater treatment plants. As stated above, with the passage of the new law, SENASA’s regulatory and supervisory role will pass to ERSSAN.

The new law eliminates the secure basis for ownership that the junta previously had. It is expected that ERSSAN will grant the junta a permit that can be renewed subject to satisfactory performance. Since the law is new, the junta has not yet received a permit. ERSSAN may or may not renew existing concessions after the initial period, regardless of past performance and quality of service.

The Itagua junta does not have a clear strategy in the face of this new law and is currently analyzing the possibility of turning the junta into a cooperative. As a cooperative, all the property, infrastructure, and lines belong to the members (i.e., clients connected to the system). If the permits expire and are not renewed by ERSSAN, the cooperative would have to dissolve, the property sold, and income generated divided among the connected water users in good standing.

6. Environment and Health

The lack of an adequate supply of potable water and proper wastewater treatment in Paraguay is reflected in its health statistics. According to the Paraguayan Ministry of Health, the second most important cause of death is diarrheal disease. Intestinal parasites, diarrhea, and anemia are among the most important causes of hospital admissions among infants and children ages 0 to 4.

Given the strong focus of the junta and management on financial sustainability, the issues of environment and health were not emphasized as strongly in interviews with junta members. Although pollution of the streams flowing through and around the Itagua urban areas has largely been caused by domestic sewage and municipal slaughterhouses, the closure of a large oil factory in the middle of town was seen as having a positive effect on the surface water quality in the area. Most references to environmental services such as wastewater collection and treatment and garbage collection were mentioned as potential fee-generating services that the junta could branch out to.

All the junta board members interviewed emphasized the pride they felt in their service to the community. Their statements demonstrate that they recognize the benefits of clean water and the need for services to keep their surroundings clean, thereby improving the quality of life in Itagua. There is constant recognition of the founders of the junta, who were medical doctors interested in reducing water-borne diseases in the community. The junta has also supported the establishment of public parks for the community in compensation for the placement of their wells within a neighborhood.

In the past decade, Itagua has been the focus of some attention by health and sanitation agencies because it lies within the watershed of Lake Ypacarai and does not have a wastewater treatment system. This lake is the main summer recreation destination of residents of Asuncion and its metropolitan area. The lake has become polluted over the past two decades due to the growing urbanization of the watershed. National statistics indicate that 36.5% of Itagua's population relies on septic tanks that are pumped out, once or several times a year, by private tank services. These tanks eject wastes directly into the surrounding large streams or the Asuncion municipal sewerage system that feeds directly into the Paraguay River. The remaining 63.5% have latrines or other similar methods of wastewater disposal that are the main cause of pollution in the watershed.

A 1990 study carried out by the Japanese International Cooperation Agency indicated that the lake was being polluted by organic wastes leaching from the septic tanks and latrines used by the residents of cities, towns, and surrounding areas in the watershed. Approximately 60% of the problem was estimated to be from residential waste and 40% from industry and slaughterhouses.

Since environmental authorities from various agencies of the central government have not been able to continue with the monitoring programs initiated in the early 1990s, SENASA has become the principal agency monitoring water quality around the country. The National University also performs periodic analyses in different regions of Paraguay.

Ten years have passed since the completion of the first studies in the watershed indicated a growing problem. Several attempts at dealing with municipal and industrial waste through committees and local governments have met with little success given the magnitude of the problem and the large investments needed in the sector. To date none of the towns in the region has a wastewater treatment system.

SENASA now monitors the area sporadically in the summer depending on the water level in the lake. During dry years (such as the 1999-2000 summer), water levels in Ypacarai Lake and the streams that feed it are low. Consequently fecal coliform counts have been high. Streams running through the town of Itagua and other towns in the same watershed are sampled randomly and inconsistently, but they do show signs of organic contaminants and high bacterial counts. Nongovernmental organizations and the Ministry of Health carry out public education campaigns periodically, but they tend to focus on solid waste. The media focus on industrial waste problems rather than on problems caused by the inhabitants of the watershed themselves.

7. Performance

Table 4 provides some of the basic indicators of the junta's performance.

Table 4: Basic Data on the Junta of Itagua

Technical	
Unaccounted-for water	<5%
Number of wells	5
Potential production of wells	258 m ³ /hour
Population served	23,455
Number of connections	4,691
Storage capacity	1070 m ³
Financial	
Profits for 1998 FY	US\$35,792
Expenditures per dollar collected in fees	US\$ 0.96
Commercial	
Cost of reconnection	US\$8.29

As Table 4 indicates, the junta is managed efficiently. Unaccounted-for water is minimal, and 100% of the connections are metered and read by seven billing agents employed by the junta. Water use has been metered at all connections since May 1982 as a precondition to accede to a World Bank loan for expansion of the water system.

Water users can be in arrears only two months, after which they are disconnected and must pay a reconnection fee. Only 2% to 3% of users are estimated to be behind in their payments at any given time. Agreements between the junta and local banks allow easy payment for the water users with only a 2.5% surcharge on the bill.

Table 5 indicates the junta's sources of income from 1996 to 1998.

Table 5: Junta's Sources of Income in Itagua

Income Source	1996 (US\$1=Gs.2057)	1997 (US\$1=Gs.2178)	1998 (US\$1=Gs.2500)
Water sales	\$193,650	\$233,729	\$264,834
New connections	45,258	35,821	34,694
Reconnections	6,842	5,225	5,246
Other Income	3,689	1,892	1,541
Total	\$249,439	\$276,667	\$306,315

The relation between the junta's sources of income has remained somewhat stable over the past years with approximately 80% of income from water sales, and reconnections representing between 2% to 3% of total income. It is expected that new connections will decrease over the next five years because the present distribution system already covers almost 100% of the urban areas.

8. Factors that Contributed to Success

A review of the general characteristics of the Itagua junta in relation to other examples of this management model indicates several aspects that have led to its success. Several of these characteristics have been mentioned throughout this case study, as follows:

- *Community participation (especially during expansion).* In its initial stages the junta relied on SENASA, neighborhood committees, and a prominent local company called Matteucci Hermanos to expand the system.
- *Professional management.* As metering of water use became prevalent in the system in 1982, computerized accounting and billing systems were also implemented. These improvements required professionals to run these systems and manage day-to-day affairs. Hiring a full-time manager for the junta has allowed the board to concentrate on the financial sustainability of the system over the longer term, rather than being mired in routine operational issues.
- *Focus on financial sustainability and recovering costs.* The financial and administrative aspects of the junta became stable in the late 1990s when the present board was elected. Current board members include accountants, former bankers, and a lawyer, and they complement the work of the general manager, who is a professional with a degree in accounting. The board provides keen oversight of the junta's finances and takes a conservative view of expansion and risk-taking. Presently it is not expanding into new environmental services until clear studies (presumably prepared by the IDB, World Bank, and SENASA) indicate the financial viability of investing and the effective return on investments through user fees.

- *Urban location favors cost recovery, efficiency, and municipal participation.* Municipal leaders, professionals, and technicians may be more likely to participate in the junta and the expansion of its services in a more urban context such as Itagua. Generally speaking, mayors in Paraguay are more focused on their urban centers than on the rural *distritos* or districts within their jurisdiction. The urban areas offer greater opportunities for tax and fee generation than rural areas. Also, rural areas are harder to reach and require greater investments from the municipalities in terms of human resources, vehicles, and heavy equipment. Yet the services very likely will not be compensated by the increased collection of fees. Citizens of a relatively developed town like Itagua are more likely to have the capacity to pay for potable water than are citizens of a smaller and poorer municipality such as SENASA would normally target. Metering of utilities is also likely to be acceptable in a town like Itagua that has such a high coverage of electrical service compared with a more rural community or small town that has no other public utility services available.
- *Independence from central government bureaucracy and minimal municipal government involvement.* The junta model is an autonomous model that flourishes because of its large degree of community participation and minimal involvement of politicians and government officials. The municipality has only one government representative who helps coordinate activities within the district, and this person does not get involved in the day-to-day management of the system. The Itagua junta is particularly insulated from political involvement because of the large population it serves. Manipulation of funds and provision of service becomes more difficult when a large, financially and politically diverse population has oversight of the management of the junta and the legal mandate exists to rectify irregular situations. Direct oversight by the consumers ensures that their demands are met and costs minimized. To be independent of central and local government requires sustainable financial management to ensure that water provision continues and is reliable.

Although smaller organizations and poorer communities are generally the target for application of the junta model, they are inherently more susceptible to manipulation by well-financed local politicians. Cost recovery is difficult in these smaller communities given high capital and fixed costs that are distributed over a small number of users. This financial weakness generally does not permit professional administration of the system, and the junta is often viewed as a political platform rather than as a service to be maintained and improved for the benefit of the community.

9. Prospects for Long-term Sustainability and Replicability

Sustainability of the Model in Itagua

The prospects for sustainability of the junta in Itagua are excellent. The junta is a mature organization with a strong focus on the basics of running a water supply company: financial sustainability, customer satisfaction, and quality services. Nevertheless, two issues could jeopardize the sustainability of the model:

- *Uncertainty about the impact of sector reform.* The impact the new regulatory law will have on Itagua's junta is uncertain. The Executive Branch of government has an interest in privatization and long-term concessions to private water companies; therefore, its commitment to allowing the junta to function is not assured although it is expected that the junta will receive a permit to continue operating. The new regulatory framework law does not emphasize this model or the community-based approach for smaller and medium-sized communities (less than 50,000). Logic would dictate that a successful water company like the one in Itagua could continue to operate without having to depend on permits granted by a centralized body, but the new law does not allow this.
- *Impact of providing wastewater services.* The junta of Itagua has benefited from not providing wastewater services, which are more costly than water supply services. Despite the recognition of the importance of providing these services, nothing yet has been done in that area. The impact of providing such a service, especially on the financial sustainability of the junta, is not yet clear. The financial and management orientation of the company ensures that any decision will be made carefully, without threatening the financial well-being of the company.

Prospects for Replicability

The replicability of this model in Paraguay will be determined by the way the sector is reformed once ERSSAN is fully operational. The two extremes proposed for WS&S services under the new law—long-term concessions (up to 30 years) to private companies and shorter concessions (10 years) to smaller providers—do not provide options for small and medium-sized cities. These cities are not as interesting or profitable to large companies with a 30-year concession, and smaller investors such as *aguateros* or juntas may not receive an acceptable return on their capital investment over a 10-year permit period.

If the law is interpreted differently, however, and concession contracts are not the only way that services can be provided, then the water board model offers a promising approach for other municipalities. The following factors should be considered for replication of the model in small towns:

- *Availability of financing for capital investment at reasonable terms.* Smaller municipalities will have difficulty financing investments without favorable loan terms and/or grants from the central government, development banks, and commercial sources.
- *A core of interested and committed citizens willing to take leadership roles in establishing the junta.* The authorities must be properly trained and funded if a stable board is to be in place in less time than the 26 years it has taken the junta of Itagua.
- *A municipal government willing to allow the junta to be autonomous, yet willing to participate actively and to coordinate local development plans.*

- *A legislative framework that allows this model to be applied, albeit with appropriate regulatory oversight.*
- *Continued and sustained efforts to involve the community at large in major decisions affecting the well-being of the company.* Consumers must also be educated of their rights and their role in demanding quality service and transparency of operations.

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Acronyms

WS&S	water supply and sanitation
CORPOSANA	Sanitary Works Company
SENASA	<i>Servicio Nacional de Saneamiento Ambiental</i> (National Environmental Health Service)
IDB	Inter-American Development Bank
ERSSAN	newly established regulatory body for WS&S services; responsible to the Executive Branch