



**ENVIRONMENTAL HEALTH PROJECT**

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**CASE STUDIES ON DECENTRALIZATION  
OF WATER SUPPLY AND SANITATION SERVICES  
IN LATIN AMERICA**

by

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## ACRONYM LIST

### Introduction

AHJASA	<i>Asociación Hondureña de Juntas Administrativas de Agua y Saneamiento</i> (Honduran Water Board Association)
EHP	Environmental Health Project
ENACAL	<i>Empresa Nicaragüense de Acueductos y Alcantarillados</i> (National Water Supply and Sanitation Company, Nicaragua)
IDB	Inter-American Development Bank
KfW	<i>Kredit für Wiederaufbau</i> (German development bank)
NGO	nongovernmental organization
O&M	operations and maintenance
PROSAR	<i>Programa de Saneamiento Rural</i> (Rural Water and Sanitation Project in Honduras)
SANAA	<i>Servicio Autónomo Nacional de Acueductos y Alcantarillados</i> (National Water Supply and Sewerage Company, Honduras)
SDC	Swiss Agency for Development and Cooperation
TOM	<i>Técnico en Operación y Mantenimiento</i> (Technical Operation and Maintenance, Honduras)
USAID	United States Agency for International Development
WS&S	water supply and sanitation

### Marinilla, Colombia

ACUANTIOQUIA	a regional agency created in 1960 to manage water systems in over 40 municipalities in the province of Antioquia
CONHYDRA	a domestic private sector company that operates WS&S services in seven municipalities, Marinilla being one
CORNARE	<i>Corporación Autónoma Regional</i> (Regional Environmental Agency)
CRA	<i>La Comisión Reguladora de Agua Potable y Saneamiento</i> (National Water Regulatory Commission)
GDP	gross domestic product
INSFOPAL	<i>Empresa nacional de agua potable</i> (the national water company, liquidated in 1987)
lps	liters per second
PSP	private sector participation
WS&S	water supply and sanitation

### Itagua, Paraguay

CORPOSANA	<i>Corporación de Obras Sanitarias</i> (National Water Supply and Sewage Company)
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ERSSAN	<i>Ente Regulador de Servicios Sanitarios</i> (newly established regulatory body for WS&S services; responsible to the Executive Branch)
IDB	Inter-American Development Bank
SENASA	<i>Servicio Nacional de Saneamiento Ambiental</i> (National Environmental Health Service)
WS&S	water supply and sanitation

### San Julián, El Salvador

ANDA	<i>Administración Nacional de Aguas</i> (National Water and Sewage Administration)
COSERHI	<i>Comisión Coordinadora para la Reforma Sectorial de los Recursos Hídricos</i> (Coordinating Committee for Restructuring of the Water Resource Sector)
FISDL	<i>Fondo de Inversión Social para el Desarrollo Local</i> (Social Investment Fund for Local Development)
GDP	gross domestic product
GOES	Government of El Salvador
IDB	Inter-American Development Bank
MOH	Ministry of Health
NGO	nongovernmental organization
STP	<i>Secretaría Técnica de la Presidencia</i> (President's Technical Secretariat)
UCM	<i>Unidad Coordinadora de Modernización</i> (Coordinating Unit on Modernization, COSERHI's technical arm)
WS&S	water supply and sanitation
WS&S-SJ	Municipal Water and Sewerage Company of San Julián

### Municipal Promoter Program, Nicaragua

AOS	Swiss Workers Aid
CNAA	National Commission for Water Supply and Sanitation
ENACAL	<i>Empresa Nicaragüense de Acueductos y Alcantarillados</i> (National Water Supply and Sanitation Company)
FISE	<i>Fondo de Inversión Social de Emergencia</i> (Social Investment Emergency Fund)
GAR	<i>Gerencia de Acueductos Rurales</i> (national-level directorate for rural WS&S, part of ENACAL)
GoN	Government of Nicaragua
INAA	<i>Instituto Nicaragüense de Acueductos y Alcantarillados</i> (Nicaraguan Institute for Water Supply and Sanitation)
KfW	<i>Kredit für Wiederaufbau</i> (German development bank)
MARENA	<i>Ministerio de Recursos Naturales y Ambiente</i> (Ministry of Environment)
MOH	Ministry of Health
O&M	operations and maintenance
RWSS	rural water supply and sanitation
SNV	The Netherlands Development Organization



UNOM	<i>Unidad de Operación y Manenimiento</i> (Operation and Maintenance Unit in each regional government)
WS&S	water supply and sanitation

## Honduras

AHJASA	<i>Asociación Hondureña de Juntas Administrativas de Agua y Saneamiento</i> (Honduran Water Board Association)
APP	<i>Agua para el Pueblo</i> , a Honduran NGO
APTOS	<i>Agua para Todos</i> (a private firm which provides water and sanitation backup support to communities in the department of Yoro)
CNSP	<i>Comisión Nacional de Servicios Públicos</i> (National Commission of Public Services)
CODEM	<i>Comité de Desarrollo Municipal</i> (Municipal Development Committee)
FHIS	<i>Fondo Hondureño de Inversión Social</i> (Honduran Social Investment Fund)
IRWA	International Rural Water Association, a committee of NRWA
MOH	Ministry of Health
NRWA	U.S. National Rural Water Association
O&M	operations and maintenance
PROSAR	<i>Programa de Saneamiento Rural</i> (Rural Water and Sanitation Project)
PROPAR	<i>Proyecto de Pozos y Acueductos Rurales</i> (a rural water and sanitation project, 1986-1997, supported by MOH and SDC)
SANAA	<i>Servicio Autónomo Nacional de Acueductos y Alcantarillados</i> (National Water Supply and Sewerage Company)
SDC	Swiss Agency for Development and Cooperation
SIAR	<i>Sistema de Información de Acueductos Rurales</i> (Rural Water Information System)
TSA	<i>Técnico de Salud Ambiental</i> (Environmental Health Technician)
TOM	<i>Técnico en Operación y Mantenimiento</i> (Technician in Operation and Maintenance)
WS&S	water supply and sanitation

## Regulation

CC	commercial code
CNSP	<i>Comisión Nacional de Servicios Públicos</i> (National Commission of Public Services), Honduras
CORFO	<i>Corporación de Fomento</i> , Chile
CORPOSANA	<i>Corporación de Obras Sanitarias</i> (National Water Supply and Sanitation Company, Paraguay)
ENACAL	<i>Empresa Nicaragüense de Acueductos y Alcantarillados</i> (National Water Supply and Sanitation Company, Nicaragua )
ERSSAN	<i>Ente Regulador de Servicios Sanitarios</i> (newly established regulatory body for WS&S services; responsible to the Executive Branch, Paraguay)
PC	price cap

PSP	private sector participation
RoR	rate of return
SANAA	<i>Servicio Autónomo Nacional de Acueductos y Alcantarillados</i> (National Water Supply and Sewerage Company, Honduras)
SIRESE	<i>Sistema de Regulación Sectorial</i> , a multi-regulatory agency in Brazil
WHO	World Health Organization
WS&S	water supply and sanitation

# INTRODUCTION

Fred Rosensweig

## Overview

The generally poor performance of the water supply and sanitation (WS&S) sector has prompted many Latin American countries to initiate reform efforts. Although most countries have recognized the failure of centralized service provision, real change is just beginning to occur. Some countries are turning to the private sector for improved service provision; others are considering increased decentralization as the primary basis of reform. A number of countries in the region have recently enacted or are currently debating legal reforms that will allow changes in the existing structure of WS&S service provision. These changes often include establishment of a central regulatory body in order to clearly separate regulatory functions from service provision. To date, most countries have not focused on developing the capacity to implement those reforms.

This document presents examples of successful local management of services. Although such examples exist throughout the region, they are not widely known; the valuable experience gained has not been available to countries grappling with similar problems. This document describes six such cases so that they can be shared with a wider audience.

The case studies were chosen around three themes: the role of small municipalities in service provision, institutional arrangements to provide backup support to rural communities, and regulation of municipal WS&S services. All the case studies selected are reasonably successful examples of decentralization and highlight two groups often overlooked in the reform process—small towns and rural communities. Each one has a track record that is based on actual performance. Taken as a whole, the case studies are a rich source of information. The last chapter pulls together the major lessons learned and major themes from the case studies.

## Background

From May 1998 to June 1999, the USAID-funded Environmental Health Project (EHP) implemented a regional activity on the decentralization of WS&S systems in Central America and the Dominican Republic. The objectives of the activity were to provide technical assistance to selected missions, promote sharing of experiences among Central American countries, draw lessons learned, and disseminate them. The activity resulted in a solid understanding of the current situation in decentralization of water and sanitation services in the region, in furthering the process of decentralization in El Salvador and the Dominican Republic, and in identifying a network of individuals and organizations interested in decentralization issues. EHP Activity Report No. 76, *Decentralization of Water Supply and Sanitation Systems in Central America and the Dominican Republic*, describes the overall activity in detail.

At the conclusion of the activity, it was evident that countries and donors have a significant and growing interest in the decentralization of WS&S systems in the region. USAID missions and other donors in most countries in the region are actively supporting the reform of the WS&S sector. Most of these countries see decentralization as a key to “modernizing” the way they do business. More than simply an improvement in the delivery of WS&S services, decentralization is also seen as a way to strengthen the role of local government and democracy in general and as an effective means to address environment and health concerns. The basic tenet is that local control, as opposed to centralized control, will result in more accountable service providers and better services. In fact, most central governments have not provided the financial resources, technical assistance, and regulatory framework that municipalities need to provide services effectively. The result is that in many cases, local governments have been unprepared to assume these new responsibilities, and services have not improved. In general, local governments in small towns do not sufficiently understand what is involved in providing WS&S services on a commercial basis, and they lack the financial resources to fund infrastructure improvements.

Despite the widespread interest in decentralization, it is evident that key people in many countries are unaware of the successes other countries have had in this area. At a regional workshop on decentralization of WS&S services held in Antigua in April 1999, three case studies were presented. One of the conclusions from the workshop was that it would be very beneficial to document such case studies more fully. As countries move from policy-level discussions to field-level implementation of decentralized schemes, they will benefit from a more complete understanding of successful examples of decentralization. The Latin America and Caribbean Bureau in USAID funded a follow-on activity to accomplish this goal, the centerpiece of which was the development and dissemination of the case studies that are presented in this document.

Decentralization is defined in this report as the transfer of responsibility to lower levels of government. Typically three types of decentralization exist in the WS&S sector:

- Devolution – transferring responsibility and authority to local governments
- Deconcentration – placing resources and staff at lower levels within the same administrative structure (autonomous, regional offices of the national water company)
- Delegation – assigning responsibility to a third party, such as an autonomous regional water entity or a private sector company.

All three types of decentralization are represented in the case studies. This report does not advocate a particular type of decentralization. The case studies were selected not only because of their demonstrated success, but also because of the direct involvement of those at the local level in decision-making.

## Key Themes and Related Case Studies

The case studies were developed around three themes that emerged from the previous activity. These themes, while distinct, represent three aspects of one overriding issue—the effect of reform and decentralization on the less-advantaged elements of the population. The main thrust of reform to date, and that which has received the most attention and publicity, is what has occurred in the major cities and often in the more developed countries in Latin America. The privatization of WS&S services in Buenos Aires and Mexico City and the reform of the water sector in Chile are clear examples of this trend. The themes and the related case studies addressed in this report all focus on two of the more overlooked groups in the reform process—small towns and rural communities.

The following paragraphs present the three themes and provide a short summary of the related case studies.

### *1. Role of small and medium-sized municipalities in service provision*

In the current sector reform efforts in the region, there is disagreement over the role small and medium-sized municipalities should play in providing services. Although the definition of small and medium-sized municipalities is somewhat arbitrary and dependent on the country context, this document defines them as ranging in size from 5,000 to 40,000 inhabitants — in effect, they include the vast majority of municipalities in a country. While some argue that WS&S is an inherently local service best provided by local government, others say that municipalities do not have the management or financial capacity to take responsibility for service provision and that other options, such as private sector participation, must be found. One way to determine municipalities' potential for taking responsibility for WS&S service provision is to examine different management models that have been used successfully in small towns.

Three case studies involving small and medium-sized municipalities are presented; each represents a different management model: an autonomous municipal company, an independent water board, and a management contract. Each model is summarized below.

- *Municipal company.* A municipal company is a publicly owned company established by the municipality. It may or may not be owned by the municipality. A municipal company, including its funds, is administered separately from the municipality. It is typically governed by a board of directors consisting of both municipal government representatives and private citizens. The municipality will generally be responsible for arranging for capital investment. Employees work for the company and not for the municipality. The key to a successful municipal company is its autonomy in operational matters.
- *Water board.* The water board model is widely used in rural communities but has not often been applied to municipalities. Water boards are, in effect, local community-based associations that are legally established and completely separate from the municipality. The water board is managed by a board of directors, and the employees

work for the water board. The water board is completely responsible for running the company, including setting tariffs.

- *Management contract.* In this model, the municipality (and sometimes a regional or central government entity) contracts with a private sector company to manage the water supply and wastewater system. The contract is for a set period of time (a minimum of five years) and takes full responsibility for management of the system. The private firm does not bring any working capital to the arrangement. Capital financing remains the responsibility of the municipality.

Following is a short summary of the three case studies involving these models.

- *Municipal company – San Julián, El Salvador.* This case study describes a successful approach to provide water supply services in San Julián, El Salvador, using the model of an autonomous municipal company. San Julián is a small municipality with a population of 22,700, which includes an urban center with 5,200 people. In 1997, by municipal decree, the municipality formed an autonomous company to manage the water system for the urban center. An elected board of directors and a permanent staff of five people manage the company. San Julián has a new water supply system built with external funds and an old unimproved wastewater collection system. Since beginning full operation in 1998, the company has been very successful. Most of the population (96%) has access to the municipal water supply system; every household connection is metered. Service is provided 24 hours per day. User fees cover all recurrent costs and depreciation; they also generate excess revenues to finance modest system expansion.
- *Water board – Itagua, Paraguay.* This case study describes a successful community-based water board model which provides water supply services in Itagua, a town located 25 kilometers from the capital, Asuncion. Originally established in 1974 when the population of Itagua was 2,975, the water board now serves the entire urban population of 25,000 with water supply services and has a full-time staff of 23 employees. The water board is administratively and legally separate from the municipality, although one of the five board members is a municipal representative. By commonly accepted standards, this model, called the junta model, 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 water board is considering ways to address this pressing issue.
- *Management contract – Marinilla, Colombia.* The successful management model presented in this case study uses private sector participation for adequate provision of water supply and wastewater services in Marinilla. Located 30 miles from the province's capital of Medellin, Marinilla has a population of 26,000. Although

Colombia transferred responsibility for WS&S services to municipalities in 1987, the regional agency of ACUANTIOQUIA continued to operate the system in 40 municipalities, including Marinilla. In 1997, ACUANTIOQUIA awarded a management contract to CONHYDRA, a domestic private sector company, to manage services in Marinilla and six other municipalities. After two and a half years of coordinated work between the municipality and CONHYDRA, services have improved. An additional 3,500 people have been connected to the water supply system. Water quality has been upgraded, unaccounted-for water has decreased, and customer satisfaction has improved. The existing infrastructure has been upgraded and a long-term investment program has been developed, with the first phase currently being executed.

## *2. Institutional arrangements for rural systems*

Although there is broad acceptance of the community management approach for daily operation of rural systems, there is less understanding of the range of institutional options available for constructing rural systems and in particular for providing backup support to rural communities after the systems are operational. National rural water supply entities have generally proven to be ineffective in providing such support. Widespread evidence exists that after several years of operation, many rural systems will face a variety of technical, financial, and management issues that must be addressed if they are to maintain services. While some communities have the capacity to address these issues with no outside assistance, most do not and will require some limited but dependable source of help. This document presents two models that have demonstrated real success and two other shorter examples. The two models that are fully presented have some central government involvement, although in a highly decentralized environment.

- *Municipal Promoter – Nicaragua.* This case study documents a model for providing backup support to community-managed rural water supply and sanitation systems in Nicaragua. The model was formalized in 1997 based on earlier experiences in the region covering the departments of Matagalpa and Jinotega — a region with a total rural population of 539,811. Water supply coverage in the region is 35% and sanitation coverage is 36%. The model builds upon the existing structure of water committees and regional promoters of the National Water Supply and Sanitation Company (ENACAL) and adds a key link at the local level in the form of a municipal operations and maintenance promoter. The municipal promoter is an employee of the municipal government but works under the technical supervision of the regional ENACAL promoter. The promoter is responsible for providing technical backup for complex repair or maintenance tasks, reviewing finances, sampling water quality, providing training, resolving conflicts, and monitoring overall performance. To date promoters have been established in nine municipalities providing services to approximately 55% of the population with improved water supply systems. After two years of operation, the results have been encouraging. Monitoring reports in the nine municipalities indicate that the current status of the 300 water supply systems under the care of the municipal promoters is rated acceptable or above average in 95% of cases. While not entirely problem-free, the model has succeeded in creating a locally

based capacity in rural WS&S within the municipality that has maintained widely accepted standards of service provision.

- *SANAA Technician in Operation and Maintenance – Honduras.* This case study documents a model for providing backup support to community-based rural WS&S systems in Honduras. The model is based on the circuit rider concept used in the United States by the National Rural Water Association. It was adapted in Honduras and renamed the Technician in Operation and Maintenance (TOM). SANAA, the National Water Supply and Sewerage Company, launched a pilot program from 1993 to 1995, in the department of Atlantida. Based on its success, the program was extended to the national level in 1995 and is now truly national in scale, covering 4,023 rural water systems serving over 2 million people. The TOM is a mobile technician who provides support to a set number of communities and visits them regularly. TOMs are employees of SANAA and work from regional offices that have substantial authority to make decisions. Currently 86 TOMS operate out of six regional offices. Despite the effects of Hurricane Mitch in 1998, the performance of the program has indicated good progress.
- *Two alternative models in Honduras – PROSAR and AHJASA.* In addition to the TOM program, Honduras has two other support mechanisms that offer operation and maintenance backup to rural communities. PROSAR (Rural Water and Sanitation Project) is managed jointly by the Ministry of Health and the Swiss Agency for Development and Cooperation. Under PROSAR, Technicians in Environmental Health are based in health centers in municipalities and are responsible for coordinating the construction of new projects, conducting training, and providing backup support to communities with existing systems. PROSAR operates exclusively in 905 communities in two departments in Honduras. AHJASA (Honduran Water Board Association) was established by Agua para el Pueblo, a Honduran nongovernmental organization. In the AHJASA model, circuit riders provide support to communities that are members of the association. This model operates in six departments and has a total membership of 300 communities.

### *3. Effective regulation of municipal services*

The issue of regulation remains one of the most contentious and difficult to resolve. Regulation provides a consistent set of rules under which services are provided. Because of the inherent monopolistic nature of WS&S services, regulation is needed to protect the interests of consumers. Typically regulation involves setting service standards, ensuring environmental protection, establishing rules for setting tariffs, monitoring water quality, and establishing rules for contract operators. Regulatory initiatives have often occurred simultaneously with efforts to decentralize WS&S services, but these dual initiatives frequently have not been complementary. Local governments often view national regulation as continued control over their management of services, and national governments view regulation as necessary to exercise legitimate oversight. Regulation of medium-sized and small cities poses a special challenge to central regulation because of



their size and wide disparities in human and financial resources. In practice, services in many small and medium-sized cities are regulated under an inadequate framework.

There is disagreement as to the scope of regulation, which can include economic, social (water quality and environment), and contract regulation. It is also not clear at what level of government to locate the regulator and whether there should be one or multiple regulators. In any decentralized system based on municipalities, the issue of regulation becomes especially important to provide some standards of service and protect public health and the environment.

While many countries are grappling with this issue, none has found a formula to successfully address it that could form the basis for a case study. Unlike the previous two themes, no case studies are offered on regulation of municipal services because no country was considered to provide a successful example of regulation with applicability to the less-developed countries in the region. Chapter 4 provides an overview of the regulatory trends, defines the issues that need to be addressed to establish a regulatory structure, and includes a brief summary of eight experiences with regulatory reform in the region including Guatemala, Honduras, El Salvador, Nicaragua, Panama, Dominican Republic, Paraguay, and Bolivia. These countries all have a relatively small population (fewer than 10 million people); all consist of a large number of small and medium-sized cities, the largest of which has a fraction of the population of the capital; and most are at an earlier stage of the sector reform process.

The chapter concludes with some preliminary observations and recommendations including the delegation of economic regulation to local governments and quality standards or social regulation to the central government. A key observation is that the responsibilities of the central government should include setting and vigorously enforcing realistic drinking water and wastewater discharge quality and service standards, promoting competition and benchmarking<sup>1</sup>, and helping local governments discharge their regulatory and service functions in a cost-effective manner.

## General Observations about the Case Studies

Several observations about the case studies are important to note.

- It was not easy to find good case studies in these three themes as they represent areas that are not easy to address. While not perfect, the case studies all represent reasonably successful examples. The primary criteria for selecting the case studies were that they have a documented track record and be applicable to the less-developed countries in the region. However, the case studies do not gloss over the weaknesses or problems and try to present the examples in a balanced and objective

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<sup>1</sup> Benchmarking is the collection, comparison, and dissemination of information, under uniform and consistent reporting requirements, of operations and investments of WS&S service providers. Examples of indicators include ratio of staff to total connections, water loss, financial ratios, and maintenance data

way. This is especially important if the case study is to be assessed and potentially used in another country or replicated in other jurisdictions within the same country.

- These case studies should be considered a representative sample. Other successful examples exist and could have been used. The selection of these particular cases should in no way be interpreted to mean that other successful examples do not exist.
- Each case study was written by an individual with first-hand experience in the region and with that specific case. In fact, all of the authors either currently reside or once resided in the case study country. The benefit of that was that each author was able to visit the site and talk to a wide range of people familiar with the example and thereby develop an accurate picture of the case.
- The case studies reinforce many of the lessons learned in the past two decades about improving WS&S services. These lessons include the importance of cost recovery and of community involvement and support, the use of appropriate technology, the existence of dependable structures for operational maintenance, and the centrality of institutional autonomy.

### How the Report Is Organized

The remainder of this document is divided into four chapters. Chapter Two includes the three case studies on management models for small towns. Chapter Three presents the three case studies on institutional arrangements for rural communities. Chapter Four addresses regulation. Chapter Five draws conclusions from the case studies and offers an outline for a future agenda.

## Acronyms

AHJASA	<i>Asociación Hondureña de Juntas Administrativas de Agua y Saneamiento</i> (Honduran Water Board Association)
EHP	Environmental Health Project
ENACAL	<i>Empresa Nicaragüense de Acueductos y Alcantarillados</i> (National Water Supply and Sanitation Company, Nicaragua)
IDB	Inter-American Development Bank
KfW	<i>Kredit für Wiederaufbau</i> (German development bank)
NGO	nongovernmental organization
O&M	operations and maintenance
PROSAR	<i>Programa de Saneamiento Rural</i> (Rural Water and Sanitation Project in Honduras)
SANAA	<i>Servicio Autónomo Nacional de Acueductos y Alcantarillados</i> (National Water Supply and Sewerage Company, Honduras)
SDC	Swiss Agency for Development and Cooperation
TOM	<i>Técnico en Operación y Mantenimiento</i> (Technical Operation and Maintenance, Honduras)
USAID	United States Agency for International Development
WS&S	water supply and sanitation

# MANAGEMENT MODELS FOR SMALL TOWNS

## Management Contract in Marinilla, Colombia

Daniel Rivera

### Abstract

This case study documents a successful management model using private sector participation for adequate provision of water supply and wastewater services in Marinilla, Colombia. Located 30 miles from Medellín, Marinilla has a population of 26,000. Although Colombia transferred responsibility for water supply and sanitation (WS&S) services to municipalities in 1987, the regional agency of ACUANTIOQUIA continued to operate the system in 40 municipalities, including Marinilla. In 1997, ACUANTIOQUIA awarded a management contract to CONHYDRA, a domestic private sector company, to manage services in Marinilla and six other municipalities.

After two and a half years of coordinated work between the municipality and CONHYDRA, services have improved. An additional 3,500 people have been connected to the system. Water service, treatment, and quality have been upgraded, unaccounted-for water has decreased, and customer satisfaction has improved. The existing infrastructure has been upgraded and a long-term investment program has been developed with the first phase currently being executed.

Marinilla provides an excellent example of the potential for private sector participation in municipal water supply and wastewater. The case study discusses the factors that need to be addressed for the model to be sustained and replicated in other municipalities in Colombia. Marinilla represents a valuable example of increasing community participation in government decision-making. Despite practical and political problems associated with decentralization in Colombia, strong evidence exists that local communities are capable of organizing accountable institutions, reducing political interference, and promoting good government practices for the benefit of their citizens.

### 1. Background and Context

#### *Colombia's Water Supply and Sanitation Sector*

In 1999 Colombia had a population of 42 million and a gross domestic product (GDP) of US\$87 billion. (GDP per capita is US\$2,093.) The water sector in Colombia is organized in a complex structure with many different institutional actors. It consists of about 1,800 water utilities, and most of these companies are publicly managed. About 45 large companies operate in cities with more than 100,000 inhabitants, while the vast majority of water utilities are located in small towns, villages, and rural areas.

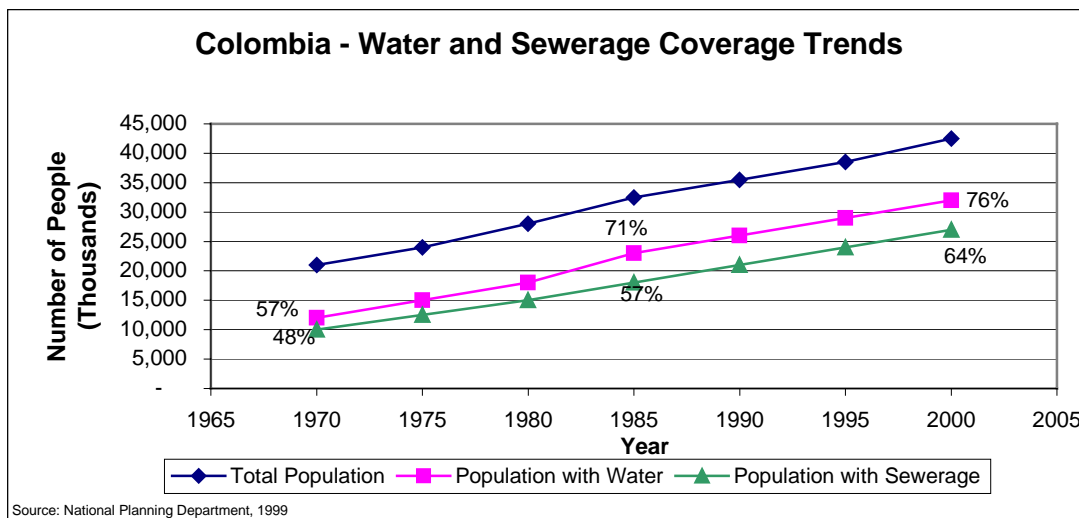
Municipal responsibility for provision of water supply and sewage services began in 1987; however, despite the progress achieved, decentralization efforts are far from consolidated. Politicization of management and conflicting roles assigned to the companies have contributed to inefficient and overstaffed operations, as well as to insufficient funds available for system maintenance and/or quality improvements. It is estimated that, on average, 90% of the total revenues are used to cover operational costs; the rate of collection is below 78%, and water losses are around 45%. Wastewater treatment has been neglected for years.

Although all these inefficiencies offer great potential for improvements through private sector involvement, only a few groups of mid-sized cities—Cartagena, Barranquilla, Tunja, Palmira, and Montería—have initiated processes to attract private sector participation in the form of management or concession contracts.

*Coverage Levels*

Nationally, potable water coverage in Colombia is about 76%. Although water supply coverage has increased significantly over the decades, it is estimated that 10 million people (24% of the population) still lack access to water services. Total sewage collection coverage is estimated at 64%, which means that more than 14 million people lack access to adequate sewerage service. Only 5% of the population has access to wastewater treatment. Figure 1 shows the evolution of water supply and sewerage coverage over the last 30 years.

**Figure 1. Colombian Water Supply & Sewerage Coverage**



Coverage figures hide problems with service and water quality. Official data estimates that only 630 out of 1,090 municipalities currently have a potable water treatment plant. In addition, it is estimated that only 60% of water distributed in urban areas meets the standards defined by the Ministry of Health.

Differences in water supply coverage between urban and rural areas are striking. Urban water coverage averages 90%, while coverage in rural areas remains significantly low at nearly 44% with poor quality of service. Urban sewage collection coverage has remained constant at 80% over the last 12 years, while only 37% of rural dwellers have access to an appropriate sewage collection system.

Wastewater treatment has been a low priority in Colombia. Only 90 (or 8%) of the country's 1,090 municipalities have sewage treatment plants in operation. The share of collected sanitary sewage receiving any treatment is below 5%. Most municipal collection systems simply discharge sewage directly into rivers or other bodies of water.

### *Water Sector Financing*

Funding for the WS&S sector in Colombia has increased from 0.4% of GDP in 1993 to 0.7% of GDP in 1999, i.e., from US\$250 million in 1993 to US\$600 million in 1998 and 1999. The new National Water and Sanitation Plan 1998-2002, called *Change to Build Peace*, envisages average annual investments of US\$650 million.

Historically, most funding has depended on government budget allocations; central government grants and legal transfers to municipalities<sup>2</sup> have accounted for the major share of total funding (60%). Less than 30% of funding has come from tariffs. As a response to the severe fiscal restrictions faced by the Colombian economy over the last three years, the new approach makes an attempt to reverse this historical trend. Although the government's contributions are expected to decrease, the main sources of investment will focus on utilities' internal cash generation and local government funds coming from federal government transfers.

Private capital investment in the sector has gradually increased. Private investment in water projects was US\$3 million in 1995, and increased to nearly US\$104 million in 2000.

### *The Legal and Regulatory Framework*

Since the end of the 19th century, Colombia has adopted a centralized model as a valid alternative to help consolidate national institutions, develop the industrial sector, and build a base of human and physical capital. By the early 1980s, however, the highly interventionist approach of the central government as regulator and producer of goods and services revealed conclusive signs of exhaustion. The centralized scheme became excessively inflexible and bureaucratic, contributing to serious administrative failures; corruption; inefficient allocation of resources; curtailment of fiscal, political, and administrative autonomy for regions; increasing violence; and economic and social stagnation.

In an attempt to increase productivity and international competitiveness and to restore the legitimacy of the political regime, Colombia adopted a new constitution in 1991 that

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<sup>2</sup> According to Law 60, 1993, municipalities are obligated to invest at least 20% of the federal government transfers into water and sewerage projects.

established the foundation for modernization of its economic, institutional, and legal structures. The new constitution, and the Public Services Law (142/1994), established a new legal and regulatory framework for public services provision, reinforcing decentralization and encouraging private sector participation in the WS&S sector.

The new institutional framework redefined of responsibilities for WS&S services between the central, provincial, and municipal authorities. The central government now sets policies, regulates, and oversees the water sector, while municipalities are responsible for provision of services and securing investment capital.

### *Water Pricing System*

The Colombian water sector has a complex tariff structure comprised of a fixed fee plus three different levels of per unit rates for consumption. Residential customers are divided into six socioeconomic categories. The pricing system is set so that high-income payers (10% of users) subsidize lower income users. This tariff structure has resulted in water utility deficits, creating a severe obstacle for sector investment.

Historically, tariff levels have been below actual costs. Efforts to rectify this situation have not been successful. Currently, tariffs paid by low-income users barely cover one-third of service costs. According to the Public Services Law, water companies should achieve full cost recovery by 2001; however, municipalities have cited socioeconomic and political impediments to meeting the deadline, and the central government extended it until 2004. Most municipalities, particularly small and medium-sized, will continue to have problems with implementation of required tariff levels.

### *The Public-Private Management Model in Marinilla*

Given the institutional background above, Marinilla was selected as an interesting case study for three main reasons:

- It represents a successful management model for water services provision in small municipalities. This model could be replicated in other towns in Colombia and elsewhere.
- Marinilla also represents a valuable example of cooperative work between the local authorities and the private sector for the benefit of the community.
- This case shows how important and constructive community participation can be in strengthening the decentralization process.

Marinilla is located at the northwest point of Colombia in the province of Antioquia, 30 miles from the capital of Medellín. It has a population of 26,000 inhabitants, with an average growth rate in the last three years of 3.5%. The local economy is based on agriculture, especially vegetables. Although a recent dip in Colombia's macroeconomic performance has increased the unemployment rate, local industrial corridors have mitigated the impact on the economy and social structure. Compared with other small

cities in Colombia, Marinilla has a relatively high level of development and its income level is above the national average.

Marinilla belongs to a privileged group of municipalities that have a good record of administrative and managerial capacity. Its proximity to Medellín contributes to its ability to offer excellent educational prospects to public leaders and local citizens. Mayors are democratically elected for three year terms. The Municipal Council, composed of 13 members, exercises political control over the mayor.

### *Provision of Water and Sewerage Services in Marinilla*

By the early 1980s, it was clear that Colombia's centralized approach had failed to deliver adequate WS&S services to communities. After decades of centralized management, the national water company, INSFOPAL, entered into an unsustainable administrative and financial crisis that led to its liquidation in 1987. Responsibility for water service provision was transferred to the municipalities, while most of the regional entities that INSFOPAL had controlled were transferred to provincial governments.

ACUANTIOQUIA, a regional agency created in 1960, was responsible for the administration, operation, and financing of water systems in more than 40 municipalities in the province of Antioquia. Initially proficient, ACUANTIOQUIA's performance was gradually affected by inefficient administrative practices. The curtailment of INSFOPAL's financial support further reduced ACUANTIOQUIA's ability to meet the increasing demand for adequate services. In 1995, the provincial government decided to initiate the liquidation of ACUANTIOQUIA, transferring the responsibility for service provision to the municipalities. Since then, ACUANTIOQUIA's role has been valuation of the operative assets utilized by the municipalities and preparation of bidding documents to select qualified operators in several municipalities under its jurisdiction.

Between 1996 and 1997, ACUANTIOQUIA developed about 40 bidding processes aimed at selecting specialized operators to manage — for a 15-year period — all the water and sewerage systems that remained under its responsibility. CONHYDRA, a newly formed private company, was awarded seven different contracts to operate systems in seven municipalities. Marinilla was one of these municipalities.

What is interesting about Marinilla's case is that both the local authorities and the community were interested in participating in the decision-making process since it directly affected their lifestyle. Residents argued that they were not willing to accept ACUANTIOQUIA's decision to sign a contract directly with a private operator without first discussing the terms of that contract. The representatives of ACUANTIOQUIA discovered that the community was surprisingly mature and organized, had a high sense of social commitment, and was willing to discuss, through participatory democratic mechanisms, the best alternative to secure an efficient provision of services.

As a result of those discussions, in 1997 the local authorities in Marinilla, backed by the community, decided to support a management contract between ACUANTIOQUIA, as the owner of the physical infrastructure, and CONHYDRA, as the private operator. The



major change the municipality introduced was related to limiting the contract period to five years, with the option to extend the contract if the operator met coverage goals and service quality standards. The contract was signed in March 1997.

The management contract clearly defines and limits the role of ACUANTIOQUIA as a technical auditor. The contract follows the guidelines established in the national constitution, which assign overall responsibility for efficient service provision to the head of the municipality. The local authorities are in charge of planning, financing, and monitoring operator performance and supervising the accomplishment of the management contract objectives. ACUANTIOQUIA retains ownership of the system until it transfers the assets to the municipalities.

ACUANTIOQUIA is committed to completing its own liquidation process. To reach this goal, ACUANTIOQUIA must set up appropriate mechanisms to transfer its assets to the municipalities, either by selling or ceding them. Current operating contracts would be transferred either to the municipalities themselves or to new water companies they create.

## 2. Scope of Services Provided

Since March 1997, CONHYDRA has administrated, operated, and maintained the water and sanitation systems in Marinilla and executed expansion programs to improve coverage and quality of service.

Water coverage in Marinilla reaches 99% of the population. Existing infrastructure allows pumping raw water from two intakes to a conventional treatment plant with a capacity of 90 liters per second (lps). Potable water is stored in a 1,000 m<sup>3</sup> storage tank. This system serves nearly 7,000 water connections. CONHYDRA has prepared a US\$42,000 project to increase treatment production capacity to 140 lps. This project has been postponed to 2001, pending approval of a tariff increase. All connections are metered, and service is provided 24 hours a day.

Marinilla has a sewerage network system that serves 90% of the population; however, the city does not have a wastewater treatment infrastructure. Sewage is discharged directly into the creek that goes across the town through more than 20 disposal points. As a result of effective action taken by the local authorities and with the technical support of CONHYDRA, the Regional Environmental Agency, CORNARE<sup>3</sup>, recently approved a US\$950,000 grant to finance the construction of a sewage collector system and a 70 lps primary wastewater treatment plant. This plant began operation at the end of 2000.

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<sup>3</sup> CORNARE is one of 37 regional environmental agencies in Colombia. These agencies are responsible for the implementation of environmental policy, defining environmental standards, setting targets, billing and collecting fines, and financing wastewater treatment facilities.

### 3. Management and Coordination

CONHYDRA is a private Colombian company that was created in 1997. It successfully manages and operates water systems in Marinilla and six other small municipalities located in the province of Antioquia<sup>4</sup>. CONHYDRA's organizational structure has two major components: headquarters staff, located in Medellín, in charge of the managerial, strategic, and administrative activities; and the municipal offices, responsible for operative and commercial activities. The municipal office in Marinilla has 16 employees, including the general manager, consumer complaints office, three plant operators, a technician expert in repairing meters, and some workers. A local group of women trained by the company is in charge of the billing distribution and meter reading process. Including headquarters personnel, CONHYDRA has 3.1 employees per 1,000 connections.

Relations between CONHYDRA and the municipality have been productive and well balanced. The private operator autonomously makes decisions about operational and managerial issues and carries out initiatives for service improvement. General policies, planning, and investment programs are discussed and agreed to at the Executive Board<sup>5</sup> level. The mayor presides over the board, which convenes every two weeks. The board makes decisions by majority vote. When the board's decisions require financial or political approval, the mayor presents the issue to the Municipal Council. For example, the Council must approve the annual budget distribution, as well as any bidding processes for contracts over US\$25,000. Part of the board's success is that, to date, technical criteria and political autonomy have guided its decisions. Beside the official board meetings, CONHYDRA promotes periodic informal meetings with the Municipal Council and key utility staff. CONHYDRA prepares technical reports that are discussed with the municipal authorities. They also organize meetings with community leaders. CONHYDRA provides timely information to consumers about investment progress, tariffs, and performance indicators, they also organize public education campaigns through the media and visit schools and community groups. All these activities contribute to a productive working environment; potential problems are nipped in the bud before they intensify.

### 4. Financing and Cost Recovery

CONHYDRA's total billing in 1999 was US\$450,000, of which US\$375,000 (84%) was collected. Revenues covered the operational and administrative costs; in addition, \$80,000 was used to amortize previous loan operations and to invest in system infrastructure.

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<sup>4</sup> The seven WS&S systems awarded to CONHYDRA, and still under its operation, are Marinilla, Puerto Berrío, Turbo, Chigorodó, Sonsón, Mutatá, and Santa Fe de Antioquia.

<sup>5</sup> The mayor of the city chairs the Executive Board, which is comprised of the Secretary of Public Works, the Secretary of Health, the Secretary of Planning, and CONHYDRA's general manager. The board would be willing to incorporate new members to the committee. New members would have the same duties and rights as the rest of the board.

In 1998, the municipality, with the technical support of CONHYDRA, undertook a US\$250,000 emergency investment program to overcome the water rationing instituted in response to a drought caused by the *El Niño* phenomenon. The municipality financed US\$150,000 of the emergency program, and the remaining US\$100,000 was received through a short-run credit operation on behalf of CONHYDRA, to be paid from the annual operational income.

Also in 1998, Marinilla completed studies for the Water and Sanitation Master Plan, which is designed to cover service demand over the next 20 years and to maintain and replace the aging infrastructure. Total investment needs have been estimated at US\$5 million.

The municipality is currently executing the initial phase of the master plan with investments of around US\$2 million. This first phase consists of repairing and rehabilitating the water and sewerage networks in Marinilla's downtown area; increasing the treatment capacity of the potable water plant from 90 to 140 lps; and constructing a sewage collector and new primary wastewater treatment plant. Sources of funds are as follows:

Municipality of Marinilla ( <i>Central Govt.Transfer</i> )	US\$ 600,000
CORNARE ( <i>Grant</i> )	US\$ 950,000
Ministry of Economic Development ( <i>Grant</i> )	US\$ 250,000
CONHYDRA ( <i>Short-term loan</i> )	US\$ 250,000
TOTAL	<u>US\$2,050,000</u>

CORNARE and the Ministry of Economic Development are providing grants. (Such grants are assigned only to those municipalities that demonstrate good managerial practices.) Disbursements are conditional on the municipality's securing other funds adequate to ensure complete financing of the project.

Four key factors have contributed to improved financing conditions in Marinilla: the introduction of a long-term planning concept, the presence of an accountable operator with clear rules of the game established in the management contract, a reasonable cash flow to guarantee credit operations, and financial incentives (CONHYDRA's profits) directly related to improvements in operational and financial performance. If CONHYDRA can increase collection rates, reduce unaccounted-for water, and reduce costs, they will increase their profits.

Tariff levels in Marinilla remain below real costs, especially for low-income consumers. Colombian regulations require high income water users to subsidize lower-income users through a progressive tariff structure. According to the national framework, tariffs include a fixed charge and three different strata of increasing charges per unit of consumption. Basic consumption is between 0 and 20 m<sup>3</sup>/month; medium consumption is between 21 and 40 m<sup>3</sup>/month; and the highest level is over 40 m<sup>3</sup>/month. In addition, there are six different strata for residential customers, ranging from low income to high

income, as well as separate categories for commercial and public agencies. Each of these categories has a different rate structure based on consumption.

In Marinilla, poor consumers pay only 34% of the average cost of services. Given the high proportion of low-income consumers, financial resources for investment are limited. In most cases, service expansion depends on the availability of external funds. Current tariffs for a typical mid-income consumer are shown in Table 1.

**Table 1. Water and Sewerage Tariff Levels in Marinilla**

<b>Fixed Charge</b>	<b>Average Price per m<sup>3</sup> of Water</b>	<b>Average Monthly Bill (Water and Sewerage)</b>
US\$ 2.50/month	US\$ 0.15/m <sup>3</sup>	US\$ 8.25

Source: CONHYDRA US\$1 = Col\$2,000

In theory, CONHYDRA can increase revenues by requesting tariff increases or increasing collection rates. If it can demonstrate that the additional revenues will be used for new investments or rational cost increases, the National Water Regulatory Commission (CRA) will approve the request. However, since ACUANTIOQUIA is still the legal owner of the assets, it is the only entity that can request a tariff increase. CONHYDRA, ACUANTIOQUIA, and the municipality are working together to request an increase in 2001.

## 5. Legal and Regulatory Framework

Individual municipalities and provincial or central government agencies have traditionally shared the task of providing WS&S services in Colombia. The 1991 constitution and the Public Services Law (142/1994) gave responsibility for provision of these services to municipalities. Based on criteria of efficiency and quality of service, the law establishes the principles of competition and regulation of monopolies and promotes the participation of private sector investors and operators. The regulatory framework defines the rules for private sector participation (PSP) in the water sector to maximize competitive forces through transparent bidding and an award process. It establishes minimum requirements for contracts and provides a coherent set of performance indicators that serve as the basis for contract supervision and control and tariff setting. The framework also provides consistency between the private sector contracts, municipal development plans, and sector policy.

Under the new framework, the Ministry of Economic Development sets policies and sector strategies, defines technical conditions for the WS&S services, and executes government programs. The Ministry of Finance and the National Planning Department establish criteria for the allocation of public resources, provide overall follow-up, and monitor the development of water projects. The National Water Regulatory Commission (CRA) oversees monopolies, promotes competition, defines tariff methodologies, and

approves tariff increments based on standard formulas and investment plans submitted by the operating companies. These methodologies rule all of the country's private and public utilities.

The Ministry of the Environment defines environmental policies. Regional autonomous environment corporations throughout Colombia (37 currently exist) are in charge of implementing policy, setting environmental targets (e.g., water quality and wastewater discharges), and billing and collecting retributive and compensatory taxes. The superintendent of public services supervises the performance of water companies, public as well as private sector, and enforces regulations. Finally, the Ministry of Health defines and oversees drinking water quality standards.

Despite significant efforts to build a sound, operative institutional and legal framework, the performance of the newly created regulatory agencies has thus far been mixed. Although central government agencies have set policy initiatives to encourage sector efficiency, their track record for actual implementation of these policies has been poor. Political interference, institutional fragmentation, and overlapping responsibilities have resulted in limited benefits.

The low tariffs and the resulting financial restrictions that impede greater improvements in Marinilla illustrate the nature of the institutional and legal conflicts. In an attempt to follow the law and the regulatory framework, municipal authorities as well as the private operator have requested authorization from the CRA to gradually implement tariff increases. Tariff increases are backed by various surveys that demonstrate that consumers are willing to pay higher tariffs if they are accompanied by service improvements.

To date, the CRA has denied any authorization to raise tariffs, arguing that ACUANTIOQUIA, as the legal owner of the assets, is the only entity allowed to request tariff increases. However, ACUANTIOQUIA is not interested in requesting tariff increases because, first, its role is only as an auditor, and it is not responsible for the management and systems operation; and, secondly, it is under a liquidation process. These institutional and legal barriers reveal the urgency of transferring the assets to the municipality and completing the liquidation of AQUANTIOQUIA as a fundamental step to facilitating the long-term financial sustainability of Marinilla's public-private management model.

## **6. Environment and Health**

Until recently, Colombia had no clear regulations governing either the use of water from various sources or wastewater discharges into these bodies. This institutional vacuum resulted in low investment in and degradation of the environment. In 1993, with the creation of the Ministry of the Environment, prospects for upgrading and protecting the environment improved.

In April 1997, decree 901 established cost-effective policy instruments to improve the quality of water resources in Colombia. The main economic instrument to induce the usage of environmental technologies is the retributive tax. Environmental targets are set by agreement between CORNARE and each municipality for a five-year period. Rates are reviewed every six months to encourage water utilities and industries to evaluate the convenience of paying the taxes, or building their own treatment facilities at a lower cost. Regional corporations collect the retributive tax, which must be paid by anyone who uses water bodies for dumping. According to this regulation, all users in Marinilla currently pay CORNARE a retributive tax of US\$ 0.40 per month. CORNARE invests these resources in the construction of treatment facilities in the municipalities under its jurisdiction.

Since 1993, the municipality of Marinilla and CORNARE have reforested the region's basin. More than 38 hectares have been recovered, and negotiations are underway to buy and reforest 15 additional hectares to protect the river basins.

During its two and a half years of operating Marinilla's water and sanitation systems, CONHYDRA has always met high quality standards for potable water. Improved operations and maintenance has upgraded the potable water in Marinilla since CONHYDRA took over. Qualified personnel operate a new water quality laboratory and equipment for quality control of drinking water. Standardized procedures and systematic daily sampling tests in both treatment facilities and the water network guarantee excellent quality of water and compliance with the government's policy on health.

## 7. Performance

The provision of WS&S services in Marinilla has improved since CONHYDRA took over operation. In March 1997, 21,600 people had connections to piped water and 19,500 to sewerage. By January 2000, an additional 3,500 of the city's inhabitants had been connected to the water system (a 15% increase). Sewerage coverage has increased by 5%, an increase of 700 connections, or 3,000 people. The quality of potable water also has been upgraded. Water pressure has been optimized and physical leakage has diminished. Unaccounted-for water has decreased from 46% to 41% in the last two years, and it is expected to drop to below 35% by 2001. Service is provided 24 hours per day. CONHYDRA has also improved customer service. According to the last surveys, user satisfaction is at 93%.

CONHYDRA has strived to maintain appropriate performance indicators in different areas. As a result of this effort, it was awarded the international certificate of quality insurance, ISO-9001, in February 2000. Relevant performance indicators are presented in Tables 2, 3, and 4<sup>6</sup>. Multiple reasons can be attributed to its success. The company has optimized technology, laid off unproductive staff, implemented outsourcing strategies in meter reading and billing, reduced unaccounted-for water, and improved collection rates. Although it was beyond the scope of this case study to assess the situation in the six other

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<sup>6</sup> Tables 3 and 4 have no data with which to make comparisons.

municipalities where CONHYDRA operates, its performance is considered to be effective.

**Table 2. CONHYDRA Technical Performance**

<b>Marinilla</b>	<b>March 1997</b>	<b>1999</b>	<b>2000 (Projected)</b>
Population	n.d.	25,280	26,070
Number of water connections	5,880	6,754	7,106
Water supply coverage (%)	94%	98%	99%
Sewerage coverage (%)	85%	88%	90%
Metering (%)	84%	93%	100%
Water produced (million m <sup>3</sup> /year)	2.0	2.06	2.12
Unaccounted-for water (%)	46%	41%	35%
Continuity of service (%)	83%	100%	100%
Consumption per connection (m <sup>3</sup> /month)	n.d.	15	15

*Source: CONHYDRA*

**Table 3. CONHYDRA Financial Viability**

<b>Marinilla</b>	<b>1999</b>
Annual billing (US\$)	448,000
Collection rate (%)	84%
Total annual revenues (US\$)	375,000
Operating cost recovered (%)	100%

*Source: CONHYDRA*

**Table 4. CONHYDRA Commercial Performance**

<b>Marinilla</b>	<b>1999</b>
Number of billed connections	5,673
Consumer complaints	697
Consumer complaints resolved	697

*Source: CONHYDRA*

## 8. Factors that Contributed to Success

Ironically, one of the main factors in the success of Marinilla's public-private management model is related to the institutional and financial crisis of the centralized model Colombia had adopted to provide public services. The failure of the centralized model encouraged small municipalities to create alternative and innovative proposals focused on guaranteeing more and better services to an increasingly demanding population. Most municipalities, however, have had difficulty breaking the habit of dependence. The transition to a decentralized scheme has been erratic and costly, while the capacity of central government entities to guide the process has lagged behind expectations. Only a limited group of cities has been able to take advantage of these difficulties and successfully face the challenge of decentralization by increasing autonomy, fostering community participation, and designing and implementing their own suitable solutions.

Three factors positively influenced the institutional and social climate in Marinilla and ensured that local service provision would improve: community participation, municipal administrative capacity, and participation of the private sector.

- *Community participation.* Marinilla's inhabitants are above the Colombian average in level of education and training. The proximity of the town to large educational centers in Medellín (Antioquia's capital) facilitates access to good education and to elevated standards of living in the region. Both of these factors encourage people to demand reliable public services. Marinilla's inhabitants know what they want, and they have developed participatory democratic mechanisms to reach agreements to improve their quality of life. CONHYDRA also makes a special effort to provide timely information to the community and to consult regularly with community leaders.
- *Municipal administrative capacity.* The municipal administrative staff in Marinilla is composed of highly qualified technical people, with a clear social interest and commitment. Local authorities are conscious of their capacity and have a strong sense of social responsibility. Marinilla has a social control mechanism along with a community that demands specific results from the local authorities.
- *Private sector participation.* The private operator CONHYDRA is committed to its objective of building and consolidating sound, accountable, and autonomous managerial practices. A well-balanced operation contract clearly defines CONHYDRA's rights and responsibilities and creates financial incentives to maintain good service standards. The community knows the rules of the game and the company's service goals. On the other hand, the contract includes penalties associated with service default. Repetitive failure in service standards can lead to contract termination. In addition, the operator's performance is closely supervised by the municipality. CONHYDRA is obligated to publish periodic reports about its activities to the community. Good customer service and concrete results have contributed to increased legitimacy and community respect.

## 9. Prospects of Long-term Sustainability and Replicability

### *Prospects for Sustainability*

Three basic factors have encouraged an increasing number of municipalities in Latin America to look for innovative alternatives to improve coverage and quality of WS&S services:

- Deterioration of existing infrastructure
- Eroded financial condition of most municipalities and public utilities
- Increasing demands of the population for more and better services

There is a growing recognition of the need to overcome the vicious cycle that has characterized the water sector development: low tariffs, insufficient investment and



maintenance, poor quality of services, low collection rates, and lack of accountability to consumers. One way to break this cycle is through the creation and strengthening of autonomous entities that have entrepreneurial criteria, are financially sustainable, and adopt clear standards of social responsibility supported by the government.

The gap between an unsustainable and weak situation as seen in many municipalities and adequate service provision indicates that there is great potential to improve the operator's productivity and social benefits for the community. The managerial model developed in Marinilla has proven to be a practical, realistic option for increased coverage and improved quality of water services. It combines private sector efficiency with effective local control over key decision-making.

This model is not guaranteed to be sustainable, however. The municipality must direct efforts to consolidate the strengths of the management model and overcome the following remaining obstacles and weaknesses:

- *Institutional and legal barriers.* To secure complete autonomy of the municipality and positive results in the long run, it will be necessary to clarify the roles of the municipality and departmental governments in the context of the decentralization process. In Marinilla for example, ACUANTIOQUIA must complete the transfer of ownership of assets to the municipality.
- *Financial restrictions.* The backlog of investment in the WS&S sector is enormous, and annual maintenance requirements are considerable especially in small municipalities. Tariff increases are necessary, although in practice they are limited by the users' capacity to pay. Private sector involvement can contribute to reducing, but will not eliminate, the need for government financing and the government's obligation to develop innovative financial mechanisms and provide guarantees and subsidies when necessary.
- *Political risk.* Although technical criteria have dominated the decision-making process in Marinilla, political interference is an underlying risk. Mayors are elected every three years, and they have a decisive influence on the Executive Board. There is a moderate risk of reversing the reform process under the weight of a populist backlash before the real benefits can become consolidated. Clear, stable rules and balanced contracts will be key factors in minimizing this type of risk.

#### *Prospects for Replicability of the Model*

Colombia has 1,090 municipalities, 500 of them with populations ranging between 12,000 and 50,000 inhabitants. A great majority of these small municipalities have shown interest in transforming public water utilities and modernizing managerial practices. The municipalities' increasing interest in improving the provision of water and sanitation services may be channeled and strengthened through the implementation of systematic technical assistance and financial programs designed by the federal government with the support of international agencies.

The following five main stages are necessary to promote the replicability of the Marinilla management model in other mid-sized municipalities and facilitate a successful transition from inefficient public water utilities to autonomous and accountable companies:

- Federal and municipal governments must ensure strong and sustained commitment at the highest political level.
- Private sector participation projects require careful preparation. Governments should finance and facilitate the sound structuring of technical, financial, and legal aspects of sustainable private sector schemes. Developing simple guidelines, model contracts, and standard bidding documents will help to reduce transaction costs. Contracts must be clear and flexible and include incentives and penalties according to the operator's performance.
- Tariff levels should be consistently evaluated in relation to the population's financial capacity and realistic investment programs. Governments need to improve the mechanisms for subsidies for the poor and facilitate wider access to the benefits of private sector involvement.
- Governments may have to maintain a financing role in the WS&S sector. The major challenge is to find the right balance between public and private financing and risk sharing. Crucial challenges for national governments and external financial institutions include the development of risk-reduction mechanisms, local capital markets, guarantees that encourage long-term private lending, and alternative financial instruments to provide accessible credit to investors and private operators for at least the first five years of contracts for municipal service provision.
- Governments must work effectively to manage consumer expectations. Experience suggests that long-term benefits from private sector involvement take time to become firmly established. To facilitate public acceptance of the reform process, governments should foster community involvement, promote the dissemination of clear and reliable information, and implement adequate supervision and control mechanisms.

## Acronyms

ACUANTIOQUIA	a regional agency created in 1960 to manage water systems in over 40 municipalities in the province of Antioquia
CONHYDRA	a domestic private sector company that operates WS&S services in seven municipalities, Marinilla being one
CORNARE	<i>Corporación Autónoma Regional</i> (Regional Environmental Agency)
CRA	<i>La Comisión Reguladora de Agua Potable y Saneamiento</i> (National Water Regulatory Commission)
GDP	gross domestic product
INSFOPAL	<i>Empresa nacional de agua potable</i> (the national water company, liquidated in 1987)
lps	liters per second
PSP	private sector participation
WS&S	water supply and sanitation

## MANAGEMENT MODELS FOR SMALL TOWNS Community Water Board in Itagua, Paraguay

Frank Fragano

### 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**

<i>Provider</i>	<b>No. of Connections</b>	<b>Population Served (est.)</b>	<b>Percentage of Total Served</b>
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	<b>37,664</b>
Population under 15 years old	37.7%
Percent of population in agriculture	16.4%
<b>Total number of households</b>	<b>8,162</b>
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 m<sup>3</sup> per hour. The water supply of the junta has grown from pumping one well at 30 m<sup>3</sup>/hour of water in 1974 to two wells pumping 88 m<sup>3</sup>/hour in 1982. By 1999, 23,455 people were served from a total of five wells producing over 250 m<sup>3</sup>/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 m<sup>3</sup> to 300 m<sup>3</sup>. The junta has planned the construction of its tanks according to needs projected a few years in advance. A new 250 m<sup>3</sup> 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.

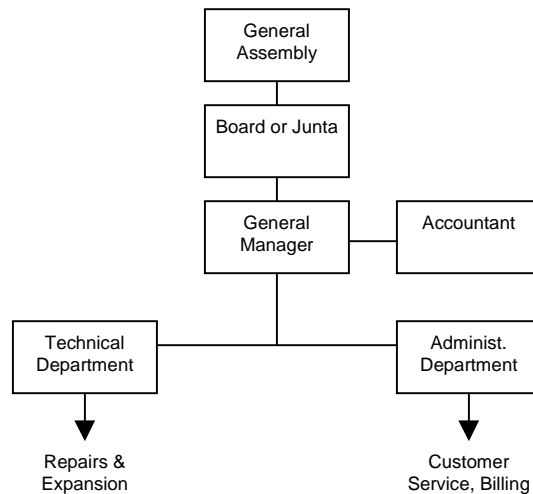


Figure 1. Organization Chart of Junta

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 m<sup>3</sup> per month, while those with ¾ inch outlets are installed in homes with 20 to 30 m<sup>3</sup> consumption or commercial/industrial connections that must pay for a minimum of 22 or 30 m<sup>3</sup>. 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 m<sup>3</sup>. This cost is slightly higher than the CORPOSANA rate for low-income residential connections (\$0.19 per m<sup>3</sup>) but lower than its highest residential rate (\$0.31 per m<sup>3</sup>). The junta tariffs are similar to those charged by other *aguateros* and juntas throughout Paraguay.

**Table 3: Tariff Structure**

Category	Meter Size	m <sup>3</sup> /Month	Basic Monthly Fee (US\$)	Excess Use Cost/m <sup>3</sup>
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 <sup>3</sup> /hour
Population served	23,455
Number of connections	4,691
Storage capacity	1070 m <sup>3</sup>
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

CORPOSANA	<i>Corporación de Obras Sanitarias</i> (National Water Supply and Sewage Company)
ERSSAN	<i>Ente Regulador de Servicios Sanitarios</i> (newly established regulatory body for WS&S services; responsible to the Executive Branch)
IDB	Inter-American Development Bank
SENASA	<i>Servicio Nacional de Saneamiento Ambiental</i> (National Environmental Health Service)
WS&S	water supply and sanitation

## MANAGEMENT MODELS FOR SMALL TOWNS Municipal Water Company in San Julián, El Salvador

Carlos Linares

### Abstract

This case study describes a successful approach to the provision of water supply services in San Julián, El Salvador, using the model of an autonomous municipal company. San Julián is a small municipality with a total population of 22,700, which includes an urban center with 5,200 people. In 1997, by municipal decree, the municipality formed an autonomous company to manage the water system for the urban center. An elected board of directors and a permanent staff of five people manage the company. San Julián is currently the only fully functioning example of a municipal company in El Salvador. It has a new water supply system built with external funds and an old unimproved wastewater collection system.

Since beginning full operation in 1998, the company has been very successful. Most of the population (96%) has access to the municipal water supply system and every household connection is metered. Service is provided 24 hours per day. User fees cover all recurrent costs and depreciation, and generate excess revenues to finance modest system expansion.

The case of San Julián provides an example of a very simple management model that has the potential to bring about a dramatic improvement in services. This model is available to any country that has delegated responsibility for water supply and sanitation (WS&S) services to municipalities. The case study discusses the factors that need to be addressed for the model to be sustained and replicated in other municipalities in El Salvador. In particular, it demonstrates how a small rural municipality can improve WS&S services if it has a reasonable measure of autonomy of operations from the municipality, improved infrastructure, and technical assistance in the early stages.

### 1. Background and Context

#### *Country Overview*

El Salvador is the smallest and most densely populated country in Latin America. It has a population of approximately 5.7 million people in an area 21,000 square kilometers in size. The population is 50% rural and 50% urban. Population growth trends show El Salvador becoming more urbanized, with the highest percentage of the population (25%) living in the metropolitan area of San Salvador, which comprises 14 municipalities. These highly urban municipalities have an average urban/rural population distribution of 80% and 20%.

El Salvador's gross domestic product (GDP) showed positive signs of growth in the post-war period of 1988-1997, increasing at an average annual growth rate of 2.2%<sup>7</sup>. The GDP in 1997 was US\$ 7,663 million (in 1990 dollars). Measured in constant 1990 US dollars, the GDP per capita in 1997 was \$1,293, showing only a slight increase over 1988 (\$1,274), due to a slowdown in economic growth (reported in 1996 and 1997). El Salvador's GDP per capita is one of the lowest in Latin America.

El Salvador has a high degree of income inequality, both in urban and rural areas. The incidence of poverty in rural areas is much greater than that of urban areas. The incidence of rural poverty is estimated at 55% of the total population, while in urban areas, it is only 16%.

The Inter-American Development Bank (IDB) attributes the slowdown in economic growth, as well as the widening gap in income distribution and access to basic public services, to institutional rigidities and inadequate public structures, which the Government of El Salvador (GOES) is endeavoring to correct.

### *Sector Situation and Organization*

The primary source of water for El Salvador is the Lempa River. It is estimated that 63% of the country's available water resources come from the Lempa River basin, with the balance drawn from other surface and underground water resources. Water is used to generate electric power, irrigate farmland, and supply drinking water. The principal user of water resources, although not the main consumer, is the electricity sector since over 60% of the country's electric power comes from hydroelectric plants. Irrigation accounts for the largest proportion of water consumption, distributing the resource over some 46,000 hectares of farmland. Human water consumption is relatively low, averaging 120 liters/person/day in San Salvador and less in the smaller municipalities owing to reduced production capacity<sup>8</sup>.

The discharging of untreated wastewater into receiving water bodies has seriously compromised water quality. Only 2% of all municipal and industrial discharges receive some kind of treatment before reaching a receiving body of water. Various studies indicate that about 90% of the country's surface waters are contaminated and unsafe for human consumption. Water shortages are widespread, yet El Salvador does not have an agency responsible for overall management of water resources. What exists instead is the disjointed and unsustainable use of the resource within each sector. "Water belongs to everyone, and to no one" is a popular expression with sector professionals in El Salvador.

There is no mechanism for allocating water rights, and the communities, municipalities, farmers, land developers, and national agencies all compete for the utilization and

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<sup>7</sup> All macroeconomic statistics and socioeconomic data are taken from Inter-American Development Bank's Loan Proposal document: "Reform Program for the Water Sector and the Potable Water and Sanitation Subsector in El Salvador," May 1998.

<sup>8</sup> Ibid.

ownership of the country's water, to the point where this competition has led to social conflict in many places. The current situation is critical with respect to quality, quantity, distribution, and conservation of water resources. El Salvador does not have a clean water act, and its environmental law falls short of providing adequate coverage on the above issues. The country has a series of uncoordinated and sometimes contradictory legal instruments that touch upon management and conservation of water resources.

It is estimated that only 57% of El Salvador's population has access to clean water: 78% of the population in urban areas and only 25% in rural areas (other sources indicate 16%). This is the lowest figure for overall water coverage in Central America. Indicators of quality of service for those who have access to piped water show a great deal of fluctuation. It is safe to say that no city in the entire country has water service 24 hours a day. Higher income families, other institutions, and private enterprises solve this problem by using water storage tanks with automatic pumping systems. In the area of sanitation, some 60% of those living in urban areas nationwide have access to sewerage systems while in rural areas, sewage systems are practically nonexistent; however, 52% of the population use latrines. These factors have a direct impact on the serious public health and environmental sanitation problems that confront the country.

The problems of the WS&S sector can be traced primarily to its management structure. Under the Organic Act of 1961, the National Water and Sewage Administration (ANDA), created as an autonomous public service agency reporting to the Ministry of Public Works, is responsible for providing services throughout the country. The act stipulates that ANDA is the only institution authorized to regulate, standardize, plan, set tariff rates, and operate water and sewage services. As a result, the structure for provision of water and sewage services can be described as a centralized public monopoly, paralleled by a growing number of private, informal operators not subject to regulation of any kind, as well as various independent water systems in urban and rural communities supported by external donations and lending programs. The Ministry of Health (MOH) is responsible for sanitation services; for example, latrine construction programs would fall under the ministry's responsibility.

In rural communities, neighborhood associations (*Juntas Vecinales de Agua*) serve as community water boards and manage their own systems, which are generally built with external funding without ANDA's participation.

ANDA operates 150 water and sewage systems in 181 of El Salvador's 262 municipalities, ranging from the country's largest—the Greater Metropolitan Area of San Salvador, with 300,000 connections—to some of its smallest, with less than 200 connections. There are 78 municipalities that operate their own (urban area) systems without ANDA participation. Of these, 72 are managed, de facto, by the municipal government itself, and 6 are managed by other mechanisms, such as a nongovernmental organization (NGO), private concessions, and mixed economy models. San Julián is among the latter and is the first and only case in El Salvador where a municipal government created a decentralized, and autonomous, municipal company for the purpose of managing its own urban water and sanitation system. San Julián, as well as all the



above-mentioned systems—urban and rural, operates unregulated by the national government. ANDA does not intervene. The policy is implicitly *laissez-faire*. San Julián is unique at present in the degree of autonomy that it has. ANDA has the power to grant concessions and has done so in a few cases.

Two particular and important characteristics of the country, which have implications for the study of the management model of San Julián, are the following:

- El Salvador has a highly fragmented municipal administrative structure (a small country with 262 municipalities, each having an average area of 80 square kilometers). Each municipality is like a county, with an urban center and rural communities.
- El Salvador has a large number of small towns with populations under 10,000 people — 89% of total urban areas. In fact, no municipality other than San Salvador would be considered medium-sized by most definitions.

### *Public Sector Reform*

The GOES has made significant strides in modernizing and reforming the country's public sector. The reform programs the government has introduced have redefined the concept of public service and are bringing about changes in areas previously operated as centralized state monopolies. Positive and profound changes have already occurred in areas such as energy, telecommunications, transport, ports, and financial services, limiting the state primarily to the role of regulator, policymaker, and promoter.

The water sector is not immune to this process. Its reorganization carries particular economic and social importance for the country. In fact, efforts to reform this sector can be traced back 20 years. During this period, several drafts of a water law, or water code, to reform the water sector and create a regulatory agency for the WS&S subsector were considered and rejected by the GOES.

Current efforts to reform both the water resources sector and the WS&S subsector began early in 1995 with the creation by executive decree of the Coordinating Committee for Restructuring of the Water Resource Sector (COSERHI). COSERHI's purpose is to coordinate studies and activities to initiate the modernization process in the sector.

COSERHI, through its technical arm, the Coordinating Unit on Modernization (UCM), and with special support from the Office of the Chairman of ANDA, worked closely with the IDB during 1997 and 1998 to prepare a US\$60 million loan proposal. This included a reform program for the water sector and the WS&S subsector. In mid-1998, the IDB approved this sectoral reform loan (the total amount of \$60 million includes a loan of \$43.7 million for water supply and sanitation).

Disbursement of funds, however, is contingent upon the presentation of two laws to the Salvadoran Legislative Assembly. The first is a general Water Law that would provide a framework for managing water resources, and the second is a law to provide the

regulatory framework for the WS&S subsector. The GOES, through ANDA and with the technical support of the President's Technical Secretariat (STP), is currently preparing these two laws.

### *Current Status of Reform*

After taking office in mid-1999, President Flores moved quickly to sign concession contracts for three WS&S systems under the mixed economy company model: Tetralogia, Plan de la Laguna (under private concession), and San Jose de Villanueva (under the San Julián model). Others being considered for decentralized management are the cities of Caluco and Suchitoto. ANDA's plan was to have 12 to 14 pilot projects ready by the time the laws are submitted to Congress, but the lack of resources for infrastructure investments, institutional strengthening, and technical assistance has slowed down the decentralization process. No new contracts have been signed since January 2000.

As of December 2000, drafts of the Water Law and WS&S Regulatory Law have been prepared. Discussions on specific content have generally not been open (outside of government circles) to the public or stakeholder groups. The draft Water Law provides for the establishment of a water authority that will regulate the use of water resources and the allocation of water rights, using a private market-oriented approach. The draft WS&S Regulatory Law would establish centralized regulatory authority that would have the sole power to grant concessions using a variety of models of private, semi-private, and community-based administration of WS&S systems. These models are based on present day experiences, including autonomous municipal companies (like the San Julián operation), mixed economy companies (like Tetralogia), community-based associations, NGOs, and concession contracts to private companies (like ASEVILLA in Plan de La Laguna, on the outskirts of San Salvador). These laws are expected to be presented to Congress in early 2001.

### *San Julián*

The municipality of San Julián is a typical Salvadoran municipality in terms of size (82 square kilometers), level of development, and population. The municipality has a total population of 22,700 people and an urban population of 5,200. One characteristic that sets San Julián apart from other municipalities is its abundance of surface and underground water resources, due to its location in a fertile valley in the foothills of the *Cordillera del Bálsamo* (Balsam Mountain Range) to the east and the Izalco and Santa Ana volcanoes to the northwest. The economic base of San Julián is agriculture, mostly coffee, sugar cane, balsam resin, subsistence farming (corn and beans), cattle ranching, and dairy products.

San Julián's administrative capacity is similar to that found in most small towns in El Salvador. The municipality has 21 full-time employees and provides the following public services: street lighting, solid waste collection and disposal, and street repairs and paving. The municipality also collects fees and taxes from commercial and industrial activities and for services provided related to civil matters such as birth and death certificates, marriages, and identity cards.

Annual municipal revenues are about 3.3 million colones (US\$380,000). These come from two sources: central government transfers, which amount to 2.5 million colones (US\$286,000), and current local income, which accounts for the remainder of 0.80 million colones (roughly US\$94,000). National and international donors, like USAID and the Social Investment Fund for Local Development (FISDL), have funded local development projects, such as the extension of the electricity network and the construction of public schools, sports fields, roads, and bridges.

San Julián is the first example of a municipal WS&S company in El Salvador. Its current legal and regulatory framework is entirely local and is based primarily on municipal ordinances. It runs independently and without guidance (or obstruction) from central government rules and regulations. A municipal company was established by the municipality and is publicly owned. It is completely separate from the municipality, including financial management, and is autonomous in operational and financial matters. The main advantage of this model is the separation of the administration of services from the regular functions of the municipality. This model may be especially attractive to small municipalities that are unlikely to be of interest to the private sector. The main disadvantages of this model are potential interference from the municipality and the fact that it does bring immediate access to capital.

USAID played a key role in the creation of the water company. In 1996, with the help of technical assistance, the municipality launched a participatory consultation process. The process identified “an improved water delivery system” as the priority. A broad-based and representative local water committee was created to obtain the financial and technical support needed for the construction of a new water system and for the creation of a municipal water company. The Municipal Water and Sewerage Company of San Julián (WS&S-SJ) was created and a new potable water system built with funding from FISDL in 1997. In 1999, a local Salvadoran NGO contributed technical assistance and funding to set up a new and independent computer-based accounting (billing and collection) system.

San Julián’s original WS&S system was built by ANDA over 50 years ago. ANDA operated the system, but it was deficient in service, quality, and quantity of water supplied. During the civil war, in 1986, ANDA abandoned the system. At the time, there were 380 connections, and water was available about two hours every other day.

By default, between 1986 and 1996, the municipality managed the services, and experienced the same deficiencies as ANDA. The fixed tariff was US\$ 1.85 per month and income from system operations was approximately US\$700 to \$900 per month. The municipality used these revenues to pay for other municipal services such as street cleaning, lighting, and repairs. During this period, the system did not have enough pressure to reach the interior of dwellings. Home owners built water sinks (small concrete reservoirs) right on the curb or walkway to store water. The Health Unit of San Julián reported a high incidence of gastrointestinal diseases among the population as a result.

The WS&S-SJ (also referred to as “the Water Company”) was created by municipal decree, duly published in the Official Journal of the State (*Diario Oficial*) of November 25, 1997. The decree contains the WS&S-SJ bylaws, which state, among other things,

that the Municipal Company (or *Empresa Municipal*) "...is created as an autonomous entity, responsible for management of water supply and sewage services and aquifer protection in San Julián."

## 2. Scope of Services Provided

The WS&S-SJ manages a new water supply system that serves the needs of the urban population of the city of San Julián. The water supply system was built in 1996-1997, replacing the obsolete system built by ANDA. WS&S-SJ also manages the sewer system.

San Julián's new water system was built with a contribution of 3 million colones (approximately US\$ 343,000) from FISDL and provided metered water to 776 users (now expanded to 812 connections). These 36 new connections have been added using the company's own resources. The population served in San Julián is estimated at 5,000 people (96% of the population in the urban area).

The water system consists of 9,330 meters of pipes, two wells, a pumping station with two 7.5 h.p. pumps, and three storage tanks (100 m<sup>3</sup> capacity each). The system is fed by two springs and one well which provide more than double the amount of water needed/consumed by the current population. Excess water is dumped into the river due to the limited capacity of the storage tanks, which overflow regularly. The water storage tanks are about 2 miles away from the water sources; there are no telecommunications between the sources and the storage tanks. Total production is 14 liters per second. The main technical problem with the system has to do with the absence of a power plant (or electrical generator), and this makes the system subject to frequent (electrical service related) interruptions. Operation and maintenance of the potable water system consists of an automatic daily chlorination process and bimonthly clean up and disinfection of wells and storage tanks. Pipes, valves, and distribution boxes are cleaned every three months.

The WS&S-SJ is currently expanding its services to the Agua Shuca district, where 110 new connections will be installed. San Julián is investing its own resources for this project. In addition, technical and feasibility studies are underway to provide services to 400 families in two rural communities (at distances of 3 and 1 kilometers from San Julián).

San Julián's sewage system, built over 50 years ago, has not been renovated. Coverage is estimated at 90% of urban dwellings. Since the WS&S-SJ began its operations, 150 meters of pipe have been laid as an expansion to a city neighborhood and 60 meters have been replaced due to obsolescence. Both of these projects were carried out using the company's own resources. The current system dumps raw sewage into a nearby river, which carries it approximately 35 kilometers to the Pacific Ocean.

Even though WS&S-SJ bylaws state that, "five percent of monthly income should be set aside for aquifer protection," very little has been done in this respect. The main problem has been the lack of effective negotiations with landowners where San Julián's aquifers

are located. The lack of political will on the part of the mayor, Municipal Council, and WS&S-SJ Board has been the primary obstacle to fulfilling this responsibility.

### 3. Management and Organization

The WS&S-SJ has five full-time employees:

- Administrator responsible for operations, management, and planning, who also acts as secretary to the board of directors and handles consumer complaints
- Administrative assistant responsible for accounting
- Plumber and plumber's assistant, who are responsible for meter reading and repairs
- Pump operator/caretaker at the well site

The board of directors of the Water Company consists of five directors and three deputy directors (or substitutes). The deputies vote only when they are representing an absent director. The board is popularly elected in a general assembly to which all citizens are invited. In practice, one of the board members submits a proposal of candidates for approval, which is accepted without objection. The secretary of the board (WS&S-SJ administrator) has a voice in the discussions but no vote. Three of the five directors and two deputy directors are water user representatives. Two directors and one deputy director are members of the Municipal Council, elected to the WS&S-SJ board by its members. Board members elect a president by majority vote. During the past administration, the mayor of San Julián was president of the WS&S-SJ board. The current mayor decided not to be on the board.

The WS&S-SJ is an autonomous entity in terms of its administrative, financial, and operational aspects. This autonomy has been the key to success. However, the mayor's role as WS&S-SJ board president created conflicts of interest with the municipality. Political agendas have crept into decision-making, payments were held back, and taxes were levied on the WS&S-SJ to support municipal services operating at a deficit, such as solid waste collection and street repairs. Another point of contention between the municipality and the company is the use of a single collection receipt, where municipal taxes are collected together with water consumption fees. This creates problems because although residents are willing to pay water use fees, they object to payment of municipal taxes for services that are not provided efficiently.

Ownership of infrastructure is based on Municipal Council Agreement No. 1, dated August 20, 1998, whereby all potable water system assets were transferred to the WS&S-SJ, except for privately owned land in which wells are located. Those parcels are under long-term lease to the municipality. Ownership of infrastructure is legally recognized by the National Property Registry, where it is registered, including all components and accessories, under the name of the Water Company of San Julián.

#### 4. Financing and Cost Recovery

To date financing for infrastructure improvements have come from FISDL through a grant of \$343,000, the exception being 36 connections paid with excess revenues generated by the company. The municipality could not have financed the initial investment with its own revenues. The availability of financing in the future is dependent on the current sector reform efforts. The company has no debt.

San Julián’s Municipal Council Decree (*Ordenanza*) published in the Official Journal of the State on February 16, 1998, provides the legal framework for water tariffs for the WS&S-SJ. This decree defines (with “power of law”) the amounts users are to pay for connections, consumption tariffs, and the fixed charge. All of these charges and fees are currently in use in San Julián. Rate increases require approval of the board and the Municipal Council. The administrator has the authority to cut off service for non-payment.

The connection charges are as follows: (All figures are in U.S. dollars.)

- For potable water system connection                      \$114.29
- For reconnection rights    \$ 2.29
- For connection to main pipe    \$ 57.14

The consumption charge is based on meter readings and includes a progressive tariff structure as follows:

- From 1 to 20 m<sup>3</sup>    \$0.08/m<sup>3</sup>
- From 20.01 to 30 m<sup>3</sup>    \$0.14/m<sup>3</sup>
- From 30.01 to 40 m<sup>3</sup>    \$0.23/m<sup>3</sup>
- 40.01 m<sup>3</sup> and above    \$0.28/m<sup>3</sup>

Public water fountains, schools, and health clinics pay \$0.11/m<sup>3</sup>. Tariffs for the municipality have not changed since 1998.

The fixed charge is the base amount and includes depreciation, maintenance, and sewage services. It is calculated as follows:

- System depreciation    \$1.10
- Maintenance    \$1.44
- Sewage system    \$0.57

**Total Fixed Charge    \$3.11**

The fixed fee recovers the investment in a 25-year period. The fixed charge represents 2.3% of minimum wage (\$137 per month). San Julián's Water Company administrator

reports that the average monthly water bill is about US\$ 4.57 (40.00 colones), equivalent to 3.3% of minimum wage.

The overall financial health of the Water Company is excellent. It began operations in April 1998, and the results for the nine-month period from April to December 1998 and 1999 are shown below.

**Financial Data for April to December 1998 (9 months)**

- Revenues were on the order of US\$ 33,257, averaging US\$ 3,700 per month.
- Operational expenses were US\$ 23,200, with an average of US\$ 2,571 per month.
- Excess revenue for the period was US\$ 10,000; the Water Company invested it in operational improvements and expansion of services.

Revenues	US\$ 33,257
Expenses (O&M)	<u>US\$ 23,200</u>

*Excess revenues*            *US\$ 10,000*

**Financial Data for January to December 1999 (12 months)**

- Revenues were US\$ 50,424, an average of US\$ 4,200 per month.
- Operational expenses were US\$ 38,574, or US\$ 3,215 per month.
- Excess revenue for the year was US\$ 11,850. The Water Company invested all excess revenues in operational improvements, resource conservation, and expansion of services.

Revenues	US\$ 50,424
Expenses	<u>US\$ 38,574</u>

*Excess revenues*            *US\$ 11,850*

As shown above, the WS&S-SJ is generating revenues in excess of its expenses. All operations and maintenance costs and depreciation costs are covered from user fees. The required 5% savings from excess revenues is available for natural resource and aquifer protection, but has not yet been used.

## 5. Legal and Regulatory Framework

The country currently has no national legal and regulatory framework for decentralized WS&S management. As previously discussed, laws are under preparation, but currently there are no central government regulations for management of the San Julián system or the Water Company other than its own bylaws. The legal owner of the company is the board of directors. By statute, the board is the legal body representing the company in all financial, administrative, and legal matters.

The Municipal Code and the Tributary Law for Municipal Services are the legal instruments that San Julián has used to create its municipal water company and collect

user fees. WS&S-SJ operates unregulated by ANDA or any other institution. ANDA is not a regulatory entity and does not intervene in systems that do not belong to it; however, San Julián is operating well without external regulation other than those mandated by its Municipal Council. When the local authorities in San Julián were asked their opinion about the creation of a national regulatory entity, their concern was, “what if they require us to change things that we are doing well?” It is not clear how the proposed regulatory law for WS&S would affect San Julián’s Water Company.

## 6. Environment and Health

Environmental protection is a matter of concern for local authorities and WS&S-SJ management; however, not much has been done in this area. Watershed management and aquifer protection are still lacking, even though statutes require that revenues be set aside to that end. The obstacle has been the lack of negotiation skills and creativity to implement incentives, such as incentives that would motivate landowners (in critical watershed areas) to work with the municipality in reforestation and soil conservation activities to protect aquifers that are the source of potable water for San Julián.

The Ministry of Environment and Natural Resources does not have regulations to this end (watershed management and aquifer protection), and there is no enforcement of the “general guidance” provided by the Environment Law. Deforestation, erosion, and pollution of the Amayo River with raw sewage are the primary concerns. The municipality and the WS&S-SJ management hope to build a wastewater treatment plant with international donor resources. They have requested assistance from donors, but have not yet received an encouraging response. Despite the fact that polluting rivers, or any body of water, with any kind of organic or chemical contaminants is forbidden and penalized by several Salvadoran laws, including “Decreto 50” (Commission for Protection of Water Resources - CEPRHI) and Irrigation Law (Ministry of Agriculture), there is no enforcement. In El Salvador, 98% of all municipal and industrial discharges do not receive treatment.

The MOH is responsible for enforcement of potable water standards, and MOH personnel visit San Julián on a monthly basis to check potable water quality. In checking the water supply, the MOH uses internationally accepted standards set by the World Health Organization/Pan American Health Organization. To date all water quality reports have met quality standards.

The Health Unit of San Julián (which is managed in a decentralized fashion by an NGO, FUSAL) reports one of the lowest incidences of gastrointestinal disease in the country. The director of the Health Unit believes that the majority of the 655 gastrointestinal disease cases reported (in all age groups) in a one-year period were mostly related to poor hygiene habits among the low-income population of San Julián. Occasionally, the Health Unit will launch a hygiene education program, given available resources, under the guidance of FUSAL and/or MOH programs.



## 7. Performance

The analysis of performance provided in Table 1 is based on available data. The records prior to April 1998 when the company began operations are incomplete, although some limited data are available to draw comparisons.

**Table 1:  
Performance Indicators,  
Municipal Water Company Of San Julián**

Performance Indicators	Prior to 1997	Current (2000)
Daily water consumption	<b>Unknown</b>	<b>625 cubic meters.</b>
Daily water production	<b>Unknown</b>	<b>1,200 cubic meters.</b>
Water supply system coverage	<b>Less than 50% of total population</b>	<b>96% of total population</b>
Average daily consumption per connection	0.25 cubic meters	<b>0.77 cubic meters</b>
Number of metered connections	<b>380 (meters not functioning)</b>	<b>812 (100% of meters functioning)</b>
Number (%) of connections billed on monthly basis	150 (40%)	<b>812 (100%)</b>
Frequency of service	<b>2 hours, every 2 days</b>	<b>24 hours a day, every day of the week</b>
Consumer complaints	<b>Related to shortages, poor quality, and lack of pressure.</b>	<b>Related to increases in monthly water bill</b>

The information shows clear improvement in both technical and commercial performance. As previously mentioned, excess water production (of approximately 600 m<sup>3</sup>) is dumped into the river on a daily basis, due to lack of storage capacity. San Julián has purchased land to construct a fourth water storage tank and is saving funds to pay for it.

With respect to consumer complaints, most complaints are related to increases in monthly water bills. Experience shows that these increases are related to two factors: excessive consumption due to internal leaks in dwelling (bad plumbing) or meter malfunction. Defective meters are replaced immediately.

A consumer satisfaction survey conducted by the WS&S-SJ last year revealed that 100% of those surveyed expressed satisfaction with the water service, and only 2 out of 10 said the water tariff was too high and should be reduced. Despite the fact that managerial-level salaries are not high enough to attract capital city professionals, San Julián's system has been managed well with local talent.

## 8. Success Factors

The WS&S-SJ is a success story. The main factors contributing to its success are the following:

- *Autonomy.* The Water Company's autonomy over operational and financial matters and separation from the municipality are the primary reasons for its success. The authority to have separate accounting from the municipality, hire and fire staff, and make its own operating decisions are key. The freedom to operate without ANDA control has allowed the company to flourish.
- *Local political will.* The local authorities who launched the Water Company in 1997 had the vision to see the benefit of creating an autonomous company and made it happen.
- *Popular support.* The popular support that was generated in favor of the creation of the Water Company, through a participatory and transparent consultation process assisted by USAID, helped the company succeed. This created the support to pay higher tariffs for better service.
- *Technical assistance.* The technical assistance was undoubtedly "the trigger that sparked the process," and without it, perhaps nothing would have happened in San Julián. The local authorities were able to seize the opportunity offered by this technical assistance program and carry it through with the preparation of a funding proposal to FISDL.
- *Financing for capital investment.* Funding from FISDL was instrumental in providing a new water supply system to work with. It is highly unlikely the project would have been a success without it. However, it should be recognized that the motivation and organization of the city improved its chances of obtaining funds from FISDL.
- *Abundance of water resources.* The abundance of water resources allows more leeway in managing the system and takes away the urgency of managing the resource. This factor also sets some limits for replicability to those cities and cases where water scarcity is a problem. Given widely publicized water shortages in many places, national level entities and policymakers are just beginning to become aware of the need to introduce water resource management at the national level. The upcoming creation of a water authority may be an opportunity to strengthen this area.

## 9. Prospects for Long-term Sustainability and Replicability

### *Sustainability of the WS&S-SJ*

The primary threat to the sustainability of the WS&S-SJ is interference of the mayor of San Julián in the affairs of the company. During the previous administration, the mayor's participation in the board of directors posed a clear threat to the financial viability of the Water Company. The mayor is constantly tempted to use the water service for political gain, favoring political party constituents with services, responding to pressures to reduce tariffs, and using WS&S-SJ revenues to finance municipal services that operate at a deficit. Although the mayor has not been able to use the company revenues directly, he

has succeeded in levying taxes and fees on the excess revenues that should be used for system expansion and improvement. Fortunately for the WS&S-SJ, others on the board have been able to counterbalance and reduce political manipulation.

Political manipulation presents a continuing threat. During his political campaign, the newly elected mayor of San Julián offered to reduce the water tariff to 10 colones a month. Even though the mayor cannot legally do this, if he implements it, this would effectively lead to WS&S-SJ's bankruptcy. Fortunately, information recently obtained from San Julián shows this is no longer an issue. The new mayor, upon learning more about the financial and legal framework, abandoned the idea. However, this example illustrates the temptation that a successful company holds for local politicians.

The other main concern is the uncertainty of what the new regulatory law for WS&S will mean for San Julián. At the moment, local wisdom in San Julián is that creation of a sectoral regulatory entity for WS&S may not be of help to San Julián. There are well-founded fears among management that the independence San Julián has had from central government bureaucracy—in setting regulations, audits, red tape, tariffs—may disappear with the establishment of a regulatory entity. This opinion may change as soon as San Julián receives information on the degree of autonomy that the regulatory entity itself will have from central government and on any sector reform that does not place responsibilities for WS&S services on municipalities.

#### *Replicability in El Salvador and Elsewhere*

The San Julián model has the potential for replication in most of the small cities in El Salvador. Very few cities under 10,000 (or perhaps even those larger than 10,000) will be interested in or attractive to private sector solutions. The San Julián model offers the potential for marked improvement in services in towns of similar size. In fact, recent developments indicate that the municipal councils of two small towns, San José Villanueva and Suchitoto, have already approved the creation of municipal companies similar to San Julián and are in the early stages of development. Four factors are key to replicability:

- The availability of investment funds to improve the WS&S systems is key. Many systems in small towns in El Salvador are in need of improvement. Very few, if any, municipalities will be able to generate the investment needed to improve the system and give a newly formed municipal company a chance to succeed. FISDL and the IDB loan currently before Congress are two potential sources of funding.
- Other municipalities will need technical assistance similar to what San Julián received. This assistance in financial management, training, accounting systems, billing and collections, and public participation will be critical in the first several years of operation.
- A legal and regulatory framework that allows decentralized systems to operate without undue central control is a prerequisite to the replication of this model.

Without a regulatory environment that emphasizes municipal control, this model will not be replicable.

- San Julián benefited from having a gravity-fed system and abundant water resources. Not every municipality will have the same natural advantages. The lack of these natural resources may raise the cost of providing services.

San Julián provides a simple, no-frills model that could be replicated in most small towns in El Salvador and abroad. It does not receive any state subsidies and is financially self-sufficient. It has worked well, with relatively modest assistance from international or local donors. The key to the sustainability and replicability of this model is the autonomy over operational and financial matters that the company currently enjoys.

\* \* \* \* \*

## Acronyms

ANDA	<i>Administración Nacional de Aguas</i> (National Water and Sewage Administration)
COSERHI	<i>Comisión Coordinadora para la Reforma Sectorial de los Recursos Hídricos</i> (Coordinating Committee for Restructuring of the Water Resource Sector)
FISDL	<i>Fondo de Inversión Social para el Desarrollo Local</i> (Social Investment Fund for Local Development)
GDP	gross domestic product
GOES	Government of El Salvador
IDB	Inter-American Development Bank
MOH	Ministry of Health
NGO	nongovernmental organization
STP	<i>Secretaría Técnica de la Presidencia</i> (President's Technical Secretariat)
UCM	<i>Unidad Coordinadora de Modernización</i> (Coordinating Unit on Modernization, COSERHI's technical arm)
WS&S	water supply and sanitation
WS&S-SJ	Municipal Water and Sewerage Company of San Julián

# INSTITUTIONAL ARRANGEMENTS FOR RURAL COMMUNITIES Municipal Promoter Program in Nicaragua

Harold Lockwood

## Abstract

This case study documents a model for providing backup support to community-managed rural water supply and sanitation systems in Nicaragua. The model was formalized in 1997 based on earlier experiences in Region VI covering the Departments of Matagalpa and Jinotega. The region has a rural population of 540,000, which represents about 70% of the total population. Coverage for water supply is 35% and for sanitation 36%. The model builds upon the existing structure of water committees and regional promoters of the National Water Supply and Sanitation Company (ENACAL) and adds a key link at the local level in the form of a municipal O&M promoter. The municipal promoter is an employee of the municipal government but works under the technical supervision of the regional ENACAL promoter. To date, promoters have been established in nine municipalities providing services to approximately 55% of the rural population in the region with improved community water supply systems.

After two years of operation, the results are encouraging. Monitoring reports indicate that 95% of the 300 systems under the care of the municipal promoters are operating at acceptable or above-average levels. While not entirely problem-free, the model has succeeded in creating locally-based capacity within the municipalities for meeting acceptable standards of service provision in rural water supply and sanitation. This case study shows what can be achieved in that regard with modest donor assistance, a sound legislative framework, a competent government institution, well-trained promoters, and a supportive municipal government.

## 1. Background and Context

The population of Nicaragua is estimated at 4.9 million people, with approximately 2.3 million living in rural areas. The Government of Nicaragua (GoN) estimates coverage levels for rural water supply and sanitation (WS&S) at 39% and 36% respectively (1999), among the lowest levels in Central America. However, these national averages do not convey the wide variations from area to area, with coverage for water supply as low as 7% in certain locations<sup>9</sup>. The GoN is aiming for provision of water supply to 50% of the rural population by the year 2002. Nicaragua also fares poorly when compared to other countries in the region in terms of more general socioeconomic development. Aggregated data for key indicators are given in Table 1.

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<sup>9</sup> ENACAL-GAR Central Office, National Information System for Water Supply and Sanitation (SINAS), 2000

**Table 1: Comparative Socioeconomic Indicators for Central America**

Country	Infant Mortality Rate (per 1000)*	GDP per Capita (US\$)*	Illiteracy Rate (%)*	Rural Water (%)*	Rural Sanitation (%)*
<b>Costa Rica</b>	<b>14</b>	<b>2,400</b>	<b>5</b>	<b>84</b>	<b>70</b>
<b>El Salvador</b>	<b>34</b>	<b>1,360</b>	<b>28</b>	<b>46</b>	<b>65</b>
<b>Guatemala</b>	<b>49</b>	<b>1,200</b>	<b>44</b>	<b>78</b>	<b>74</b>
<b>Honduras</b>	<b>31</b>	<b>600</b>	<b>27</b>	<b>79</b>	<b>78</b>
<b>Nicaragua</b>	<b>46</b>	<b>340</b>	<b>34</b>	<b>39</b>	<b>36</b>
<b>Panama</b>	<b>18</b>	<b>2,580</b>	<b>9</b>	<b>N/A</b>	<b>N/A</b>

Source: \*UNICEF, 1997/98

Nicaragua source: Regional WS&amp;S Network, 1999

From its inception in 1979 until very recently, the Nicaraguan Institute for Water Supply and Sanitation (INAA) was the sole agency responsible for all aspects of service delivery and regulation. The sector has recently undergone a major transformation, with the establishment of a new legal and institutional framework which allows for the creation of distinct entities each with a specific mandate: the National Commission for Water Supply and Sanitation (CNAA) responsible for national-level sector policy and strategic planning; the newly reformed INAA, now acting as a regulatory body rather than a service provider; and the National Water Supply and Sanitation Company (ENACAL), responsible for the supply and operation of services nationally in both urban and rural areas. These reforms are part of a long-term modernization strategy adopted by GoN that will allow for increased private sector participation, particularly in the potentially profitable urban systems. One of the most significant aspects of the reforms is the separation of operation of services from regulation. While this separation is clear for the urban sector, the law governing the creation of ENACAL (No. 276, January 1998) is much more ambiguous for the rural sector.

#### *The Rural Water Supply and Sanitation Sector in Nicaragua*

Responsibility for the delivery of rural WS&S services falls under the mandate of ENACAL, which has a dedicated national-level directorate for rural WS&S (GAR) and five regional GAR offices. (Nicaragua has six regions but only five have rural directorates.) The GAR of Region VI, which includes the Departments of Matagalpa and Jinotega, has historically had the greatest latitude in decision-making. Its director has always reported directly to the national ENACAL-GAR office in Managua, whereas directors of other regions were, until very recently, subordinate to the departmental ENACAL delegates. In each region the government has financed a small Operation and Maintenance Unit (UNOM), using funds generated by the urban sector. The function of each regional UNOM is to provide long-term backup support to help communities solve more complex technical and administrative problems, monitor water quality, and maintain a database of the status of systems.

Nationally ENACAL-GAR is the most important implementing agency in the sector, executing between 75 and 80% of all projects in conjunction with international donor funding. There are currently only a limited number of other agencies engaged in the

implementation of projects in the rural WS&S sector. One of the strategic aims of ENACAL-GAR is to actively encourage the expansion of alternative implementation capacity for the rural WS&S sector, thereby enabling GAR staff to focus on its core functions of planning, coordination, and regulation. A summary of the main agencies, other than ENACAL-GAR, involved in the sector is given in Table 2. Private companies rarely operate community-managed systems, as the sector does not generate sufficient profit margins to attract them.

**Table 2: Main Implementation Actors in Rural WS&S, Nicaragua**

<b>Organization</b>	<b>Role and Responsibility</b>	<b>Relationship with ENACAL-GAR</b>
National NGOs	Implementing organizations responsible for limited numbers of community-managed RWSS projects.	Work coordinated and regulated by regional ENACAL-GAR; adheres to GAR policy guidelines and community-based approaches.
International NGOs	Implementing organization and in some cases donating and/or channeling funds for large-scale community-managed RWSS programs at municipal and regional level; support to regional and national-level sector initiatives.	Work coordinated and regulated by regional ENACAL-GAR; adheres to GAR policy guidelines and community-based approaches; works in partnership with ENACAL-GAR at national level.
Social Investment Emergency Fund (FISE)	Investment of funds, mainly from World Bank, for large-scale social infrastructure projects, including RWSS in concentrated rural populations; traditionally more focused on physical outputs.	FISE executes projects mainly through the private sector. Projects must be approved by ENACAL-GAR and adhere to sector policies and approaches, but in general FISE has limited capacity to implement community-based projects.
Municipal Authorities	Legally mandated to guarantee provision of social services under municipal law, but in reality very limited direct implementation of RWSS projects in municipalities, mainly due to financial constraints.	Increasingly involved with regional ENACAL-GAR in planning and coordination at municipal level; also becoming involved in backup O&M support.
Ministry of Health	Legal GoN agency responsible for water quality and epidemiological surveillance; no direct implementation of RWSS projects.	Close coordination and information sharing with regional ENACAL-GAR; community health worker is usually member of water committee – joint activities in public health awareness, system disinfection, etc.
Private Companies	Involvement limited to drilling in concentrated rural population areas; direct provision of hand-pumps and spare parts.	Strong links with manufacturers of “rope pump” which is sector standard; ENACAL-GAR encouraging direct spare part and sales outlets.

In parallel with modernization of state-run institutions such as INAA, the GoN has been actively pursuing decentralization of services from central to municipal levels. This culminated in the passage of a series of modifications to the existing municipal law in 1997, placing far greater responsibility and accountability on elected municipal governments to ensure the provision of basic social services, including water supply and sanitation. This responsibility applies to both the urban population (*casco urbano*) and those living in rural areas of the municipality. Due to limited economic capacity, many municipal authorities are unable to cover the costs of most capital investment projects;

however, this change in the law does have significant implications for provision of backup support services to rural communities.

In October 1998, Central America suffered unprecedented damage from Hurricane Mitch, which left thousands dead and millions of dollars in damage to transport and social infrastructure. In Nicaragua alone, some 738 rural water supply schemes were completely destroyed or seriously damaged, along with nearly 10,000 household latrines. Over 50% of all damage to the rural WS&S sector occurred in the Departments of Matagalpa and Jinotega, which lay in the path of the storm in the northeast of the country. Many of these damaged systems have been repaired or replaced by ENACAL-GAR, with support from external donors. However, the damage caused by the hurricane has undoubtedly set back development efforts in the region and has forced communities to expend what limited resources they may have built up to rehabilitate services to pre-hurricane levels.

### *Selection of the Case Study*

The case study described in this section concerns the approach taken by ENACAL-GAR in Region VI to improve the provision of operation and maintenance (O&M) services to a growing number of communities with water supply schemes in rural areas. This particular case was selected for the following reasons:

- In the context of Nicaragua, Region VI stands out as one of the few positive examples of ENACAL-GAR working successfully to incorporate municipal government authorities in a system of service provision for water supply systems to rural communities. Although similar approaches involving municipal authorities have been applied elsewhere in the country, most notably in Esteli and Nueva Guinea, they have not been as successful or else they have relied on heavy subsidies from donor-funded programs.
- The model adopted by ENACAL-GAR in Region VI, while not totally problem-free, has succeeded in maintaining reliable O&M service for rural systems to an expanding population.
- The model was established and expanded at a time of far-reaching institutional reform in the WS&S sector generally, and has continued to function despite the devastating impact of Hurricane Mitch on the social and economic infrastructure of this part of the country.

### *Background to Region VI, Matagalpa and Jinotega*

Region VI contains the two administrative departments of Matagalpa and Jinotega. The region covers 18,168 km<sup>2</sup>, approximately 15% of the national territory. The region has both alluvial plains and mountainous areas and extends to the border with Honduras in the north. Annual rainfall varies from over 1,200 mm in the north to as low as 800 mm in the drier southern zone. Consequently, both surface and groundwater sources are exploited in different parts of the region. In general, groundwater quality is good,



however the region contains one localized area with very high levels of arsenic, which has posed a serious public health risk in the past.

Like other regions of the country the ENACAL-GAR office in Region VI has received long-term financial support from a number of international donors including UNICEF, the European Union, KfW, the Swiss Workers Aid (AOS) and the Netherlands Development Organization (SNV). The operating budget for the financial year 2000 is just over US\$ 1 million, of which the GoN contributes approximately 32%. While most donors have tended to offer large-scale funding for capital investments, both AOS and SNV have concentrated on institutional support. In particular SNV has provided a series of long-term technical advisors who have been engaged in supporting the strategy for decentralization of O&M service provision to the municipal level for the last several years.

### *Rural Water Supply and Sanitation Coverage Levels*

The rural population of Region VI is estimated at 540,000, or about 70% of the region's total population. Most rural communities tend to be fairly small, ranging from 40 to 50 people up to several hundred, but there are also a number of communities with several thousand inhabitants. To date a total of 777 community-managed systems have been built in the region, serving approximately 187,000 people, which represents a coverage level of about 35%. Rural sanitation coverage in the region is at about 36%<sup>10</sup>, however this figure includes coverage for both rural concentrated and rural dispersed populations. The variation in coverage levels in the rural population for all municipalities is shown in the Table 3 (it excludes urban population, i.e., those living in principal municipal towns).

The socioeconomic profile of rural communities varies across the region, with those in the southern part, particularly along the main transport corridors, having better access to cash incomes. In this area, they are also more organized, having had previous experience with community activities. Conversely, the rural population in the east and north of the region tend to live in much more isolated areas with limited transport infrastructure and often very poor levels of government assistance. Illiteracy and health and social problems all tend to be higher among this more isolated population. Wage-labor opportunities are limited, except during the coffee harvest in areas at higher elevations. In general the rural population in the region relies on subsistence agriculture, complemented by a small amount of cash cropping which provides only limited income. Average annual household incomes for the rural population are estimated at approximately C\$7,000 to \$10,000, equivalent to US\$550 to \$800. In reality most of this income is in the form of agricultural production for family consumption, and typically households have a cash surplus only following the twice-yearly harvests in June and October.

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<sup>10</sup> ENACAL-GAR Matagalpa-Jinotega, SINAS, 2000

**Table 3: Coverage Levels for Rural Population of Matagalpa And Jinotega Departments - Region VI**

Municipality	Total Rural Population	Water Supply		Sanitation (Latrines)	
		Pop. Served	As % of Total Rural Pop.	Pop. Served	As % of Total Rural Pop.
<b>Region VI (Total):</b>	<b>539,811</b>	<b>187,357</b>	<b>35%</b>	<b>193,211</b>	<b>36%</b>
<b>MATAGALPA DEPARTMENT</b>	<b>299,852</b>	<b>137,154</b>	<b>46%</b>	<b>138,351</b>	<b>46%</b>
Matagalpa	51,614	21,839	42%	20,328	39%
Dario	29,977	23,139	77%	19,552	65%
Esquipulas	11,601	5,621	48%	5,409	47%
Matiguas	35,856	4,101	11%	6,648	19%
Muy Muy	11,769	765	7%	2,884	25%
Sebaco	10,136	8,712	86%	8,605	85%
San Dionisio	15,820	10,209	65%	11,305	71%
San Isidro	12,133	11,557	95%	9,264	76%
San Ramon	24,674	21,940	89%	23,726	96%
Terrabona	10,915	10,719	98%	7,500	69%
Rio Blanco	19,461	2,116	11%	106	1%
Tuma - La Dalia	47,055	16,031	34%	22,543	48%
Rancho Grande	18,841	405	2%	481	3%
<b>JINOTEGA DEPARTMENT</b>	<b>239,959</b>	<b>50,203</b>	<b>21%</b>	<b>54,860</b>	<b>23%</b>
Jinotega	53,237	24,213	45%	35,139	66%
La Concordia*	6,472	3,740	58%	1,928	30%
San Rafael Nrte*	12,640	1,114	9%	815	6%
Yali*	20,016	5,711	29%	3,160	16%
Cua - Bocay	62,602	7,697	12%	6,810	11%
Pantasma	31,596	6,350	20%	5,152	16%
Wiwili	53,396	1,378	3%	1,856	3%

\*Municipalities not serviced by ENACAL-GAR Region VI.

Note: The shaded municipalities have active Municipal O&M Promoters.

## 2. Scope of Services Provided

At the national level, ENACAL-GAR has clear guidelines for the selection and type of rural water supply systems which are typically simple in design and use technology that is acceptable to the end-users. The principal types are either hand-dug wells or drilled boreholes with handpumps, or small piped gravity-fed schemes. Very occasionally, piped schemes with diesel or electrical pumps will be constructed, but this is only in cases where technical circumstances dictate and where communities have the capacity to operate and maintain them properly. In Region VI there are only 12 schemes with mechanized pumps out of a total of more than 770 systems. The locally-manufactured rope pump (*Bomba de Mecate*) is now the sector standard handpump due to its affordability and robust design. The normal level of service is single-point supply in the case of handpumps, or public tap-stands. However, household connections are made

available if the water source and topography allow for sufficient capacity in the system and if each family is willing to pay the additional connection costs.

On-site excreta disposal for rural communities is limited to latrines of differing designs that take into account localized variations in groundwater level and soil type. The most common designs are the improved traditional pit latrine and the ventilated improved pit latrine, incorporating a raised pit as necessary. In the past, certain programs have constructed various types of composting latrines. Generally ENACAL-GAR does not promote this design, however, due to the amount of maintenance and follow-up required for proper operation and maintenance.

### **3. Management and Organization**

Historically, investments provided by donor institutions for the rural WS&S sector in Nicaragua have been primarily focused on physical construction, with the understanding that communities benefiting from the schemes should carry out routine O&M work after completion of the project. Hence the modality formally adopted by ENACAL-GAR for administration and management of rural WS&S systems is based upon the establishment of an elected water committee, a prerequisite for physical construction to be undertaken. Typically the committee is elected for a period of two years and has four to six members. It is usually responsible for a range of activities including general management of the system, technical oversight and repairs, promotion of improved hygiene practices, collection of tariffs, watershed protection, and formal representation with external bodies. ENACAL-GAR has developed guidelines governing the administration and functioning of these committees.

In most instances, the water committee can provide effective management and O&M of its own water supply system. However, there are a number of tasks that are often beyond the scope or capacity of the committees. In order to support the water committees, the UNOM of the GAR has historically provided a range of services to communities across the region with a small team of mobile promoters. The extent and frequency of support varies by community, depending on the level of internal cohesion and organization. Some committees have been able to operate with a minimum of external assistance.

Operation and maintenance of latrines is considered to be a household responsibility; therefore the UNOM promoters are not actively engaged in monitoring their use and upkeep. However, since proper O&M of latrines impacts the general environmental health status of communities, the UNOM staff do integrate this issue into their regular activities. For example, at the request of the committee, the promoter will work to promote the adoption and proper use of latrines when a number of households within the community are evidently not using them consistently. In cases where new families are integrated into a system, the promoter will work together with the water committee members to ensure that households with a new water connection also construct their own latrine.

### *A New Model for O&M Service Provision*

Over the last 20 years, various donor-supported programs have constructed over 770 rural WS&S projects in Region VI, while the UNOM staffing has been limited to one unit head and three promoters operating from the regional headquarters in Matagalpa. For several years this arrangement was feasible, albeit with a highly centralized management structure. However by the mid-1990s, with an ever-increasing caseload and a static level of funding, it became clear that a reassessment of long-term O&M service provision was necessary for the region. In 1996, with support from both the Swiss Workers Aid and the Netherlands Development Organization, the regional ENACAL-GAR office started to develop a strategy for expanding and decentralizing O&M support to rural areas to meet the increasing demands of communities in need of regular support.

The new model for O&M service provision builds on existing components of the old arrangement (the water committees and the Regional Promoter of UNOM), but it adds a key linking mechanism at the local level in the form of a Municipal O&M Promoter. Local representation is a critical factor not only because of the sheer size of the region, but also because of the need for a close understanding and rapport between the promoter and the communities with which they work. In this context the Municipal O&M Promoter operates as part of the municipal government, or *Alcaldía*. This arrangement is open to the possibility of political interference, which is addressed at greater length below. The new system implies a change in role for the Regional UNOM Promoters from direct implementation of tasks to support and supervision. The number of staff, key tasks, and functions of each tier in the model are given in Table 4.

### *Establishing an Agreement with the Municipal Authorities*

ENACAL-GAR management wants to include a broad spectrum of agencies and individuals in the decision to establish this new approach to service provision at the local level. Therefore the starting point is always based on roundtable discussions involving the *Alcaldía*, the municipal-level representatives of the Health, Education, and Environment Ministries, any locally-based NGOs that may be active in the sector, and representatives of some of the water committees in the municipality. In this forum ENACAL-GAR presents its concerns over constraints to provision of adequate support to communities based on the existing, centralized model and explains the implications of the recent legal and institutional reforms. There is often a discussion relating to the social, economic, and environmental costs of poor or nonexistent O&M services. The end result is usually an agreement in principle and the subsequent signing of a joint agreement that sets out the roles, responsibilities, and financial obligations of each party, with ENACAL-GAR and the *Alcaldía* comprising the two principal signatories.

In the majority of agreements reached in Region VI to date, the *Alcaldía* has covered the costs of salaries, social benefits, and running costs of the Municipal O&M Promoter, with ENACAL-GAR providing a motorbike, training, and technical back-stopping. Normally the central government ministries agree to provide specialist inputs and training; they also agree to coordinate their activities with the promoter at the local level. However, the economic reality of many rural areas of the region is such that no single “blueprint”

**Table 4: Region VI, O&M Support to Rural Communities**

	<b>Level and Scope of Operation</b>	<b>Key Tasks and Services Provided</b>
Community Water Committee:  President, Vice President, Health Promoter, O&M Technician, Finance, Environment	<ul style="list-style-type: none"> <li>• Present in every community with a WS&amp;S system.</li> <li>• Works with individual households.</li> <li>• In some larger communities O&amp;M technician may be a part-time paid position.</li> </ul>	<ul style="list-style-type: none"> <li>• Weekly O&amp;M tasks include cleaning, regular maintenance, disinfection, system inspection and repair;</li> <li>• Tariff collection, bookkeeping, and accounts;</li> <li>• Organizing regular committee and community meetings, fund-raising activities;</li> <li>• Hygiene promotion among individual households, communal work days, clean-up and vector control;</li> <li>• Watershed protection, nursery planting and re-forestation activities.</li> </ul>
Municipality  Municipal O&M Promoter, Alcaldía	<ul style="list-style-type: none"> <li>• Currently operating in 9 municipalities, covering 318 communities (55%) of all WS&amp;S projects in the region.</li> <li>• Typically one promoter covers between 25 &amp; 50 communities</li> <li>• Reports to line manager within the Alcaldía.</li> <li>• Training, technical supervision and back-stopping provided by Regional UNOM staff.</li> </ul>	<ul style="list-style-type: none"> <li>• Regular scheduled visits to communities;</li> <li>• Technical backup for emergencies or more complex repairs or maintenance tasks;</li> <li>• Periodic review and auditing of bookkeeping and accounts, financial management training;</li> <li>• Water quality sampling (bacteriological) – results shared with community and Ministry of Health;</li> <li>• Conflict resolution and support in re-constitution of the water committee;</li> <li>• Ongoing training and orientation for committee members and users in key areas: hygiene promotion, system disinfection, O&amp;M monitoring;</li> <li>• Data collection and monitoring of system;</li> <li>• Acting as key interlocutor with external agencies and institutions.</li> </ul>
Region or Department  Regional UNOM Promoter, ENACAL-GAR	<ul style="list-style-type: none"> <li>• Overall responsibility for backup for all WS&amp;S in region; 3 promoters and 1 head of unit.</li> <li>• Reports to Regional Director of ENACAL-GAR</li> <li>• Direct O&amp;M service provision to communities in 8 municipalities.</li> <li>• Backup and training support to 9 Municipal Promoters.</li> </ul>	<ul style="list-style-type: none"> <li>• As above for municipalities without Municipal Promoter;</li> <li>• Ongoing training and monitoring visits to supervise Municipal Promoters;</li> <li>• Scheduled visits to Alcaldías to discuss progress at municipal level;</li> <li>• Collection, collation, and analysis of data;</li> <li>• Direct intervention to support Municipal Promoter as required;</li> <li>• Liaison with key line ministries at municipal and regional level (Health, Education, Environment).</li> </ul>

approach can be set up, and ENACAL-GAR recognizes that it must adopt a pragmatic, flexible approach if it is to increase service coverage in these areas. In at least two instances where the *Alcaldía* had insufficient financial resources to support the promoter, other agencies have stepped in to pay the salary (in San Dionisio an NGO, and in El Cuá-Bocay the Ministry of Health).

To date, Municipal O&M Promoters have been established in nine municipalities, providing backup services to approximately 55% of the population with water supply systems constructed by or with the approval of ENACAL-GAR. The regional director views this as an ongoing initiative, and currently the UNOM is in discussion with five municipalities (Sebaco, San Isidro, Dario, Río Blanco, and Esquipulas) with a view to establishing new promoters.

#### *Training and Induction of New Municipal O&M Promoters*

Municipal Promoters are put through a regular training process. Once a suitable candidate has been selected and agreed upon by the main parties, there is an initial round of training and orientation by the regional UNOM staff. This classroom-based training uses the ENACAL-GAR training-of-trainers course which consists of subjects such as sustainability of projects (rules governing the functioning of the water committees), human relations and conflict resolution, community participation and gender relations, community organization, water quality, and basic environmental sanitation. The new Municipal O&M Promoter is also introduced to the standard operating procedures and the computerized reporting and information systems of UNOM and ENACAL-GAR.

In the field, a senior UNOM promoter works with the new Municipal O&M Promoter giving practical, hands-on training, including techniques for water sampling, chlorinating of water supply systems, conducting sanitary inspections of physical infrastructure, operation and maintenance of water tanks, break pressure tanks, maintenance or repair of handpumps, etc. The practical training also includes revision and checking of accounts and ledgers, revision of minutes of meetings and committee or general assembly decisions, and wherever possible, support to existing water committees. After a period of further field-based training and supervision, the Municipal O&M Promoter is formally accredited by ENACAL-GAR and given an identification card that shows that he is qualified to provide O&M services. In general the entire training and orientation process takes about six to nine months, depending on the aptitude of the individual.

Municipal O&M Promoters are required to report to the regional UNOM office once every month to submit reports and coordinate and prioritize activities with the Regional Promoters. Whenever possible, ENACAL-GAR includes every Municipal O&M Promoter in its regular training program for staff of the institution and encourages the promoters to meet together regularly to learn from one another and share common experiences, problems, and solutions.

#### *Activities of Municipal O&M Promoters*

Typically a Municipal O&M Promoter serves about 30 communities; however, these communities do not all require the same level of backup support. ENACAL-GAR and UNOM maintain a register of communities indicating the current status of the water supply system based on three key criteria: technical functioning, administration (financial health), and the organizational cohesion of the water committee and general community support. If the water supply scheme is considered to be functioning well in all three aspects, the Municipal O&M Promoter visits only once every six months, i.e., the

minimum frequency, and takes water samples. If the system is considered to be functioning, but with some difficulties in any one area, the promoter visits approximately every three months. If the system is in poor condition, the promoter visits once a month or more frequently as required until matters are improved. If the Municipal O&M Promoter is unable to resolve the situation by himself, he will call on one of the more experienced regional UNOM promoters for assistance. In cases where there is a serious problem (e.g., technical fault or violent conflict between members), the promoter is expected to visit the community immediately.

On average, a visit by the Municipal O&M Promoter to any given community lasts about four hours; the duration depends to a large extent on the type of problem or situation facing the community. The most important activities carried out in a visit are—

- a meeting and open discussion with the full water committee to go over progress and any outstanding problems;
- a review of the accounts and financial status of the system;
- water sampling and a sanitary inspection of the water system (handpump or intake, tanks, mainline, and tap-stands) and general environmental conditions in the community, i.e., surface drainage, solid waste; and
- a check on the condition of latrines, if that is flagged as an issue by the committee.

The visit may also include technical advice and assistance for on-the-spot repairs, cleaning and disinfection of systems, or conflict resolution. The Municipal O&M Promoters also carry out preplanned activities as part of their community visits, such as helping to organize a general assembly meeting, a restructuring of the water committee by majority vote by all community members, or communal work days such as cleaning the intake or tree planting at the water source.

### *Operating Environment*

Under the standard agreements the Municipal O&M Promoter effectively works as a member of the *Alcaldía* and is supervised by a staff member with the authority to review and approve work plans and reports. In addition to this reporting structure, the promoter must pass copies of all monthly reports and the results of water quality sampling to the regional UNOM. ENACAL-GAR reserves the right to monitor the work of the promoter in the community to ensure minimum levels of attention and to see that technical standards are being met. ENACAL-GAR is also able to lobby the *Alcaldía* to ensure that the promoter is provided with adequate resources and logistical support. These relationships are not always problem-free, given the range of municipal authorities in the region. These bodies have varying financial and human resource capacities; they also have varying levels of enthusiasm for the initiative. For the majority of the *Alcaldes* (mayors), there is a political dimension to employing a Municipal O&M Promoter, as it shows concrete action to resolve problems facing the municipal electorate.

Political tension runs high in rural Nicaragua and in some areas the population is polarized between the two principal political parties. In order to counterbalance some of the inevitable political interference of the incumbent and opposition party members,

ENACAL-GAR actively informs and involves a broad spectrum of communities in the process of establishing the Municipal O&M Promoter. In general ENACAL-GAR has longstanding and positive relations with rural communities based on the process of constructing the original systems. ENACAL-GAR uses that historic relationship to reinforce the message that the work of the Municipal O&M Promoter is nonpolitical in nature. Despite these efforts, one of the negative aspects most frequently cited by community members is that the Municipal O&M Promoter is seen as a mechanism of control by the *Alcaldía* and that the introduction of the position is an attempt to take over management of the systems and income generated by the tariff<sup>11</sup>.

#### *Involvement of the Private Sector*

As mentioned earlier, the private sector has had minimal involvement in rural WS&S service provision to date, its involvement being limited to a few instances of borehole drilling and pump installation in some of the larger rural communities. In the last two years ENACAL-GAR made attempts to stock established private shops with spare parts for the rope pump, which is produced in-country, including lengths of rope, special washers that are attached to the rope and lift short columns of water up the rising main, and concrete foot-valves. The pilot initiative did not succeed because the shopkeepers believed sales would not be sufficiently profitable to warrant the financial risks of stocking spare parts. In reality demand is high and the regional UNOM office in Matagalpa continues to operate a revolving fund for the purchase of parts from the factory. These parts are then sold at cost to individuals from community water committees who come in to Matagalpa. An earlier initiative to privatize the sale of chlorine powder in municipalities was derailed by Hurricane Mitch. Following the disaster, huge amounts of chlorine were made freely available to rural communities through a number of government agencies and NGOs, thereby effectively destroying the market.

## **4. Financing and Cost Recovery**

### *Financing of Recurrent and Capital Costs*

For many years much of the capital investment costs for WS&S projects in rural Nicaragua were met by external funding from international donors. Given that history, macro-level planning, budgetary decisions, and donor relations have been handled by the central GAR office in Managua. The GoN allocates funds to ENACAL from the national budget to meet its core management and administrative costs; all other staff are funded by program costs. Communities have traditionally contributed to construction costs by providing unskilled labor and locally available construction materials only. In 1998, ENACAL-GAR introduced a pilot project in which communities were required to pay a portion of capital investment costs in cash. This amount varied, with a set contribution for boreholes to cover part of the drilling costs and a proportion of the cost of a piped

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<sup>11</sup> Based on interviews with community and water committee members in the municipalities of San Ramón, San Dionisio, La Dalia, and Tarrabona, May 2000.



scheme, amounting to up to 20% of the total budget. Initial results of the pilot were remarkably successful, indicating that residents in rural areas were willing and able to pay for improved WS&S services. After the massive destruction caused by Hurricane Mitch in the region, the community contribution was waived for all those projects requiring repair or reconstruction. However, for the construction of new systems, the community contribution has been re-established as standard policy.

Replacement and rehabilitation costs (other than for the type of massive destruction caused by Hurricane Mitch), including the replacement of pumps, major repairs to piped networks, or expansion of services to new households, are the responsibility of the community. ENACAL-GAR will provide technical assistance and guidance, but the community must either raise the money itself or approach local government or other potential donors for funding.

For each individual system, ENACAL-GAR works together with the community to agree on a tariff range, which accounts for the type of system to be installed, number of users, seasonal fluctuation in cash income, and special compensation for more vulnerable households. Typically, the O&M tariff ranges from C\$1 to \$2 per household per month for a small handpump system, to C\$5 to \$10 per month for a more complex, larger piped scheme. (U.S.\$1=C12.5) Due to seasonal cash flow constraints, many communities agree to pay the quota on a quarterly or bi-annual basis. The quota is designed to cover all maintenance costs and includes an additional sum that is, in theory, used to build up a reserve fund for extraordinary costs (e.g., replacement of capital equipment). As with similar programs in subsistence rural economies, tariff collection can be problematic and can cause serious conflicts within the community. On the other hand, there are many examples in the region of well-organized and motivated communities that have accumulated significant funds and have even established dedicated bank accounts for their system maintenance.

#### *Financing of the Municipal O&M Promoters*

Under the new system of decentralized service provision, responsibility for paying salaries and operating costs of the Municipal O&M Promoter generally falls to the *Alcaldía*. Financing of personnel is probably the single most critical constraint facing the system of locally-based service providers. This point is illustrated by individuals on all sides of the system, promoters and *Alcaldías* alike, complaining that it is sometimes not possible to meet salary costs on time or that there is insufficient funding from municipal budgets to cover transport costs. However, these constraints must be seen in the wider national context, where central government has devolved increasing responsibilities to the municipal level in many different sectors, without a corresponding increase in municipal budgetary allocation.

At present, this model for decentralization is working, albeit with ENACAL-GAR intervening with some of the *Alcaldías* to ensure compliance with the financial arrangements that are part of the agreement. For the longer term, ENACAL-GAR is investigating ways of sharing some of the costs of the Municipal O&M Promoters. Such arrangements may include the semi-privatization of O&M service provision, whereby

communities would be asked to pay for a portion of the costs, including those specifically related to water-quality testing. The director of Region VI's ENACAL-GAR believes that this will be possible, especially where communities see the correlation between regular maintenance and the continuity of supply and quality of water provided. However, this transition will be a difficult one as long as the promoter is seen to be linked with the *Alcaldía*; some communities will inevitably view a shift in financial responsibility as a form of indirect taxation on their water supply systems.

## 5. Legal and Regulatory Framework

The decision by ENACAL-GAR in Region VI to develop the decentralization strategy, with a shift in emphasis toward a greater regulatory role, was made on the basis of the recent institutional reforms of the WS&S sector nationally. According to the new institutional arrangements, INAA is now the organization legally mandated with regulation of both the urban and rural sectors. The law treats the urban sector in great detail, while the regulatory framework for the rural sector is much more ambiguous. In practice, due to its very limited financial and human resources, INAA is almost exclusively concerned with regulation of urban systems. In the absence of any further refinement of the law, it is generally assumed that ENACAL-GAR will continue to function as both service provider and regulator for the rural subsector. In this capacity, the ENACAL-GAR office of Region VI has pushed forward its strategy to decentralize the provision of O&M services to the municipal level. The lack of clarity and definition of the law with regard to the rural sector means that ENACAL-GAR is the government agency with *de facto* responsibility for both service provision and regulation.

The second major legal and regulatory basis for the new model of decentralization of O&M services is the recent modification of the Municipal Law (nos. 40 and 261). This newly modified law provides a legal pretext for involvement of the municipal authority in guaranteeing the provision of adequate social services to the resident population. Under this law the *Alcaldía* actually has the authority to administer water supply systems in rural communities located within the municipality, if it can prove that the systems are being poorly managed *and in addition* can demonstrate that it has the technical, financial, and administrative capacity to run them itself. In practice, there has been extremely few cases where an *Alcaldía* attempted to take over administration of a community-managed scheme. Given the weak financial and technical capacity of the vast majority of the *Alcaldías*, this legal point has become a technicality. The regional ENACAL-GAR has used a more general interpretation of this law to encourage *Alcaldías* in the region to take on progressively more responsibility for backup service to rural WS&S projects completed in their territory. In practice most communities do approach the *Alcaldía* for assistance when they experience problems with their water supply system. Under Nicaraguan law, ownership of the physical infrastructure of the water supply system can be transferred from the state to the community only when the particular community has acquired recognized legal status, or *Personería Jurídica*. Currently, attaining this status is possible only through formation of an Association or Cooperative dedicated to the administration of the water supply system. In practice, ENACAL-GAR

has always made a symbolic transfer of the system to the community, witnessed by the municipal authorities and police, making the community *de facto* owner of its system.

A pilot project was launched in Region VI in 1997, with funding from AOS, to strengthen sustainable community management of schemes through the formation of a Municipal Association of Water Committees. This has been an iterative and learning process for both the communities and the institution, and to date one association has been formed in the municipality of San Dionisio, and another is being formed in La Dalia. Using the legal title of the municipality-wide association, each member community is able to register formal ownership of its water supply system. However, the process of forming an association is lengthy and convoluted; and in the case of rural cooperatives there are political sensitivities involved because of Nicaragua's recent history. In recognition of these problems, a new law currently under review by the National Assembly, entitled The Law of Citizen's Participation, establishes a much quicker and less bureaucratic mechanism for granting of *Personería Jurídica* to community organizations with a not-for-profit, social objective. Under this new law the *Alcaldía* will be able to facilitate the granting of *Personería Jurídica* at local level.

## 6. Environment and Health

Issues relating to health and the environment are included as part of the initial orientation and ongoing training of the Municipal O&M Promoter. The personnel of the UNOM use the training curriculum and materials of the regular ENACAL-GAR program relating to hygiene education, behavior change, sanitation, vector control, and protection of the watershed or direct source of the water system. Municipal O&M Promoters are also included in the training program of the regular ENACAL-GAR staff and participate in relevant training workshops with other line ministries, for example, with the Ministry of Health staff in workshops on standardizing water quality testing and disinfection methods. In turn, the Municipal O&M Promoters are expected to address these issues as part of their regular ongoing activities when visiting rural communities. As mentioned above, the Municipal O&M Promoters (like their regional colleagues from UNOM) are expected to address sanitation issues when visiting their communities. This is part of the sanitary inspection, which includes an assessment of general conditions in the community, risk of source water contamination from chemical products used in agricultural, surface drainage, solid waste management, and control of animals in and around houses. Where there are problems with the use or condition of household latrines, the promoters are expected to motivate users to improve their practices or give technical advice concerning repair or reconstruction.

Whenever possible, promoters are encouraged to schedule their visits to coincide with the visit of Ministry of Health (MOH) staff in order to coordinate efforts and reinforce health messages. In general there is good cooperation between ENACAL-GAR and MOH staff in the region, and last year a Memorandum of Understanding was signed between the two institutions to facilitate information sharing, promote coordination and planning, and share training and transport resources. The environment ministry in Nicaragua

(MARENA) is rather weak institutionally and has more limited human resources than the MOH. Therefore, coordination at the municipal level is more problematic.

Although broad-based training in health and environment is part of the overall job preparation for promoters, and despite the specifics of the job description, health promotion is often given short shrift in the actual performance of the day-by-day job. The general perception of communities and promoters is that the promoters' job is essentially a technical one in which they give physical interventions higher priority than software issues, such as health and hygiene promotion. It should be added that this weakness is not confined to the Municipal Promoters; it is an issue for the UNOM Regional Promoters and some of the regular ENACAL-GAR program staff as well. There has been an ongoing debate within the institution about changing the allocation of resources to increase emphasis on software issues. The ENACAL-GAR management is fully committed to integrating health and environment as part of the O&M backup service. However, as with many such initiatives, the success of the approach relies very much on the attitude of the individuals concerned. At present, there is no systematic monitoring of health or behavior indicators incorporated into the work of the Municipal O&M Promoter. This is an obvious weakness within the program which is partly the result of lack of resources; it is also affected by attitudes about the relative importance of non-technical interventions.

## 7. Performance

One of the key functions of the regional UNOM is to monitor the status of rural water supply systems and to maintain a database to inform decisions about which system or community may require priority attention. As mentioned above, the Municipal O&M Promoters use that database system to report on the three principal aspects of the water supply project: organization, administration, and technical condition. Various indicators are measured within each category and an overall ranking of "above average," "acceptable," or "below average" is determined in each case. The subindicators used to determine these rankings are given in Table 5. ENACAL-GAR does not include any measure or estimation of the ability of the community to expand its system to meet increased demand resulting from population growth. The monitoring system relies on the objective opinion of all promoters concerned in reporting on the overall status of the community water supply system. The final report which is entered into the centralized databank in the regional ENACAL-GAR office indicates only the overall ranking of the system, as well as a score for risk of contamination which combines the result of the sanitary inspection and the water quality test results (fecal coliform count per 100 ml).

Perhaps the most problematic performance indicator for rural communities in the region is the level of non-payment of tariff. The amount due but not paid is recorded (in theory) by the treasurer of the water committee in the accounting ledger, which is reviewed by the Municipal O&M Promoter on each visit to the community. The reporting for this

**Table 5: UNOM Community Monitoring and Ranking System**

<b>Status</b>	<b>Above Average</b>	<b>Acceptable</b>	<b>Below Average</b>
<b>Organization</b>	<ul style="list-style-type: none"> <li>Committee functioning with all members active;</li> <li>Decisions made in previous month respected and adhered to by community;</li> <li>Meetings and decisions fully recorded;</li> <li>Committee functions without external support.</li> </ul>	<ul style="list-style-type: none"> <li>Committee functioning, but incomplete;</li> <li>Decisions made by committee in previous month not universally agreed on nor respected;</li> <li>Committee functions, but with some need for external support.</li> </ul>	<ul style="list-style-type: none"> <li>Committee not functioning;</li> <li>No decisions taken in previous month;</li> <li>Organization impossible without external support.</li> </ul>
<b>Administration</b>	<ul style="list-style-type: none"> <li>Tariff system operable with 90% of h/h contributing;</li> <li>Accounting ledgers balanced with monthly financial report;</li> <li>Income covers 100% of running and repair costs of system plus balance.</li> </ul>	<ul style="list-style-type: none"> <li>Tariff system operable, but with less than 90% h/h contributing;</li> <li>Accounting ledgers incomplete and reporting period is more than 1 month;</li> <li>Income covers 100% of running costs only.</li> </ul>	<ul style="list-style-type: none"> <li>Tariff system does not function;</li> <li>Accounting ledgers incomplete and no financial report;</li> <li>Income does not cover full running costs.</li> </ul>
<b>Technical</b>	<ul style="list-style-type: none"> <li>Physical system fully functional, out of service &lt;1 day in previous month;</li> <li>Disinfection on regular basis;</li> <li>Water supply 24 hours/day.</li> </ul>	<ul style="list-style-type: none"> <li>System partially functional, out of service 1-3 days in previous month;</li> <li>Sporadic disinfection;</li> <li>Water supply at least 8 hours/day.</li> </ul>	<ul style="list-style-type: none"> <li>System functions poorly, out of service &gt; 3 days in previous month;</li> <li>No disinfection;</li> <li>Water supply &lt; 8 hours per day.</li> </ul>

**Table 6: Consolidated Monitoring Results (San Dionisio, La Dalia, San Ramón, El Cuá-Bocay, Santa Maria de Pantasma, Jinotega, Muy Muy, Matiguas, Terrabona)**

<b>Status</b>	Ranking of Community Water Supply System			
		<b>Above Average</b>	<b>Acceptable</b>	<b>Below Average</b>
<b>Organization</b>	No.	211	75	14
	%	70.4	25.0	4.6
<b>Administration</b>	No.	202	83	15
	%	67.4	27.6	5.0
<b>Technical</b>	No.	204	85	11
	%	68.0	28.4	3.6

criteria to the regional UNOM is based on figures recorded at the latest visit to the community. Results from monitoring reports in the nine municipalities with Municipal O&M Promoters indicate that the current status of the 300 water supply systems under their care is acceptable or above average in 95% of cases for all three categories of performance<sup>12</sup>. The consolidated results are shown in Table 6.

While these results are comparable to the performance of systems attended to by the Regional UNOM Promoters, they may appear to be recording a disproportionate number of systems with above average performance. There are a number of reasons for this:

<sup>12</sup> UNOM Monitoring Results, ENACAL-GAR, Matagalpa – Jinotega, May-June 2000.

- The majority of the systems in the municipalities of Santa Maria de Pantasma, Muy Muy, Matiguas, and Terrabona have been constructed relatively recently (within the last 12 to 36 months);
- At least half of the systems in the nine municipalities are in small communities with schemes based on drilled boreholes and using the Bomba de Mecate handpump – this type of system tends to present many fewer problems (in all three categories) than the larger, more complex systems; and
- Systems that no longer provide any type of water supply to a community, but which may be under consideration for rehabilitation, are not recorded in the system, thereby giving a relative weighting to the categories of “acceptable” and “above average.”

## 8. Factors That Contributed to Success

The impetus for change in Region VI originally came from a very practical dilemma: increased demand for backup service combined with limited human and financial resources. Starting in 1996, the management of ENACAL-GAR established a dialogue with both municipal authorities and community representatives in the region to explore and refine the possibilities for decentralized service provision. This process was undertaken with an understanding of the anticipated legal and institutional reforms that were already underway; it culminated in the passage of new laws in 1997 and 1998. The network of Municipal O&M Promoters is the result, now covering approximately 55% of rural communities with WS&S projects in the region. The system is far from problem-free and requires constant attention and follow-up by regional ENACAL-GAR staff; however, it has succeeded in maintaining the coverage levels and standards of service provision to a growing population. It has also succeeded in creating and increasing a locally-based capacity in WS&S within the municipalities. A number of factors contributed to the success of this model in the region.

- *Pro-active Management:* The director of the regional GAR office and head of the UNOM have been instrumental in initiating change before reaching a crisis point in terms of institutional carrying capacity. They were realistic in their appraisal of the existing constraints and also had the vision to anticipate, and work within, the reform process taking place in the WS&S sector nationally and the broader framework of decentralization of power from central to municipal levels.
- *Reputation of ENACAL-GAR:* The longstanding and very positive reputation of the institution in the region should not be underestimated as a factor in the success of establishing this model. The Matagalpa-Jinotega region suffered heavily during the protracted civil war in the 1980s; ENACAL-GAR was one of the few government agencies that continued to operate in remote and insecure areas during that time. Many of the individual staff members have vast experience of the region and are very well known by the local population, a crucial factor in building confidence on all sides.

- *Donor Assistance:* The financial and technical assistance provided by donors was instrumental in focusing efforts on this important initiative. With a large program in the region, management time and resources to concentrate on this type of strategic, non-operational activity are limited. The continued financial support of AOS and UNICEF and the presence of a dedicated policy advisor from SNV were all important supportive factors.
- *Flexible Approach:* In many ways the application of this model has been an iterative process which has had to account for varied circumstances from one municipality to the next. In a politicized and resource-scarce working environment such as rural Nicaragua, the success or failure of a theoretical model can be determined to a great extent by “real world” constraints. Therefore, the flexible and pragmatic approach adopted by ENACAL-GAR has been a key factor in its successful expansion. The program probably would not have been as successful if a more rigid or “blueprint” style approach had been adopted in or all municipalities.
- *Receptiveness of the Municipal Governments:* While the motivation for becoming involved in this initiative may be largely political, the generally positive and open response of the various municipal authorities has been a key to success. This is true both in terms of paying the O&M Promoter and also in providing logistical and office support, a working space, and recognition as part of the municipal government team.
- *Institutional Transition and Legal Reform:* The fact that the WS&S sector as a whole was undergoing a period of fundamental transition was an important factor in overcoming inertia about decentralizing service provision. This was just as important in overcoming internal resistance to change as it was in putting the argument forward with external stakeholders. The modification of the Municipal Law and the open-ended interpretation of the role of ENACAL-GAR vis-a-vis regulation of the rural sector were both key factors in establishing the legal and institutional basis for the model.

## 9. Prospects for Long-term Sustainability and Replicability

As mentioned above, this approach to maintaining and expanding O&M service provision at the local level is by no means a perfect system, and a number of difficulties threaten its performance and sustainability in the long term. Perhaps the greatest problem, and certainly the most difficult to quantify, is the underlying perception among the population that regular, preventive maintenance of their system is not a worthwhile investment. For the most part rural Nicaragua is desperately poor; surplus (cash) income is extremely limited at the household or community level. Indeed, the same is true for most municipal authorities in the region, excepting one or two where there is large-scale commercial coffee production. Despite the best efforts to motivate stakeholders at all levels, there is a limit as to how far people are prepared to invest scarce resources.

### *Sustainability of the Model in Region VI of Nicaragua*

The ENACAL-GAR office in Region VI continues to receive technical assistance from SNV but at a lower level of effort than previously (40% time), and the longer-term financial support from AOS was finalized two years ago. UNICEF continues to be open to providing limited and indirect financial support to the initiative; for example, by allowing older motorbikes from operational programs to be donated for use by the Municipal O&M Promoters. It is clear that the donor support to date has already established the institutional capacity within the GAR office to continue maintaining the current agreements and expanding the system to include new municipalities. However, the longer term performance and sustainability of the model in Region VI is likely to be affected by the following factors:

- *Financial Constraints:* The modified Municipal Law places greater responsibility for guaranteeing service delivery on the municipal authority, without a corresponding increase in central government funding to the municipalities. Until this situation is adequately redressed, the imbalance will obviously continue to result in severe constraints at municipal level to pay for an O&M Promoter. Experience shows that with an absolute short-fall in available funds, rural WS&S is often a relatively low priority. For the rural communities themselves, limited economic opportunity will continue to act as a brake on the amount of investment residents are able to make in their water supply system.
- *Political Interference:* The model relies heavily on the municipal authority to support the decentralization of services, with ENACAL-GAR operating as the technical and regulatory body. Inevitably, certain of the municipal leaders, or *Alcaldes*, will view the provision of services as a means of favoring one group in his or her constituency over another. Conversely, the same community members may see the involvement of the *Alcaldía*, under any circumstances, as a threat to the autonomy of their system. Until now, ENACAL-GAR has been able to use its good standing to act as an independent broker in disputes of this nature. However, in the long term, the involvement of the *Alcaldía* may effectively marginalize those communities that support the political opposition.
- *Legal Transfer of Title:* Until a relatively quick and straight-forward mechanism is established for communities to obtain legal status (*Personería Jurídica*), the final transfer of ownership of the system will be the exception rather than the rule. This factor is a strong psychological determinant in the extent to which communities are likely to invest in the maintenance of their water supply system and to pay for O&M services in the long term.

### *Replicability of the Model in Other Regions of Nicaragua or Elsewhere*

As mentioned in the introduction, there are other examples of regional ENACAL-GAR offices in Nicaragua trying to involve municipal authorities in post-project support. These have not proved to be as successful as Region VI, nor have they been adopted in such a



systematic way or on such a wide scale. There are a number of important reasons why this is the case; some relate to conditions or interventions that can be controlled by institutions (either by national government ministries, municipal governments, or international donors), while others are much more subjective and are tied to the general interest and motivation of stakeholders at all levels.

On the basis of experience in Region VI, the factors or conditions that are important for replication of this model are as follows:

*National or Subnational Level:*

- Donor interest (national government or international agency) in providing the relatively modest, but essential administrative funding to allow for the model to function. This includes hard-to-quantify costs relating to such inputs as management time, training, transport, and technical assistance where necessary.
- The existence of a transparent legislative framework and policy for the decentralization of social service provision to local or municipal level, combined with the corresponding and adequate provision of financial resources allocated from central government budgets. For the foreseeable future, the cost of the programmatic infrastructure will require central government subsidies.
- A competent and credible government institution responsible for regulation and technical standards for the WS&S sector, with a clear policy supportive of community management and administration of rural water supply systems.
- The presence of senior government institution representative(s) at the regional (subnational) level, able to maintain a more or less permanent dialogue with municipal government officials and with other key departments, i.e., health, education, and social action.
- A (small) dedicated group of more experienced and better-equipped staff able to provide supervision, monitoring, and technical back-stopping to the municipal-level O&M promoters.

*Municipal Level:*

- Political imperative and willingness on the part of the municipal authorities sufficient to guarantee regular and sustained payment of salaries to the promoters, with social benefits and the provision of adequate working conditions.
- A reliable means of transport (usually a motorbike) for the Municipal Promoter and the ability to dedicate a sufficient amount of time to communities without being multi-tasked, i.e., stretched too thin by other assignments, by the municipal authorities.

- Clear communication and a minimum degree of trust established between the municipal government and the rural population benefiting from WS&S systems and the services provided by the Municipal O&M Promoter.
- The organization of communities into legally recognized bodies; formal transfer of title of the land and physical infrastructure of the systems from the implementing agency to the communities themselves.

## Acronyms

AOS	Swiss Workers Aid
CNAA	National Commission for Water Supply and Sanitation
ENACAL	<i>Empresa Nicaragüense de Acueductos y Alcantarillados</i> (National Water Supply and Sanitation Company)
FISE	<i>Fondo de Inversión Social de Emergencia</i> (Social Investment Emergency Fund)
GAR	<i>Gerencia de Acueductos Rurales</i> (national-level directorate for rural WS&S, part of ENACAL)
GoN	Government of Nicaragua
INAA	<i>Instituto Nicaragüense de Acueductos y Alcantarillados</i> (Nicaraguan Institute for Water Supply and Sanitation)
KfW	<i>Kredit für Wiederaufbau</i> (German development bank)
MARENA	<i>Ministerio de Recursos Naturales y Ambiente</i> (Ministry of Environment)
MOH	Ministry of Health
O&M	operations and maintenance
RWSS	rural water supply and sanitation
SNV	The Netherlands Development Organization
UNOM	<i>Unidad de Operación y Manenimiento</i> (Operation and Maintenance Unit in each regional government)
WS&S	water supply and sanitation

# INSTITUTIONAL ARRANGEMENTS FOR RURAL COMMUNITIES

## The SANAA Technician in Operation and Maintenance Program in Honduras

Andrew Trevett

### Abstract

This case study documents a model for providing backup support to community-based rural water supply and sanitation systems in Honduras. The program was launched by SANAA, the National Water Supply and Sewerage Company, from 1993 to 1995 as a pilot in the department of Atlantida and, based on the success of the program, was extended to the national level in 1995. Honduras has a rural population of 3,188,000, which represents 53% of the total population. The program is truly national in scale, covering 4,023 rural water systems and serving over 2 million people.

The model is based on the “circuit rider” concept used in the United States by the National Rural Water Association. It was adapted in Honduras and renamed the Technician in Operation and Maintenance (TOM). A TOM is a mobile technician who provides support to a fixed number of communities, visiting them regularly. TOMs are employees of SANAA and work from regional offices that have substantial authority to make decisions. There are currently 86 TOMS in six regional offices. The TOM program does not have any formal relationship with other government agencies including municipalities. Despite the devastation and disruption caused by Hurricane Mitch in 1998, the program has continued to make good progress in its assistance to communities.

The case study demonstrates that a focused effort to provide backup support to rural communities can make a significant difference in the sustainability of the systems. To date only 10% of the systems under SANAA’s jurisdiction are not functioning at all and require assistance well beyond what the TOM can do. The case study explains in detail the elements of the program and the factors that contributed to its success.

### 1. Background and Context

Until the early 1990s, institutions involved in the development of rural water supply in Honduras concentrated their efforts on constructing facilities. Training in such areas as operation, maintenance, and sanitation was provided only during system construction. Many systems were going out of commission far sooner than their anticipated design life. In 1992, the National Water Supply and Sewerage Company (SANAA) carried out a study on the operation and maintenance (O&M) of rural water systems. A number of common problems were identified, for example:

- Community water boards were not meeting on a regular basis.
- The monthly tariff, if collected, was inadequate to cover routine maintenance.

- The community had not designated an operator to be responsible for upkeep.
- Water systems were not being chlorinated.

As a result of this study a pilot project, designed with significant USAID input, was tested in the department of Atlantida from 1993 to 1995. The “circuit rider” concept of the U.S. National Rural Water Association (NRWA) was adapted for Honduran conditions and named the Technician in Operation and Maintenance (TOM). The circuit rider is a mobile technician who is responsible for providing maintenance to a set number of member water systems in a state. The term “circuit” refers to a set of communities that are visited by an individual on at least a quarterly basis or more often if necessary. Similarly, the TOM program provides technical assistance and advice to rural community water boards about managing and maintaining their water systems. A community water board is a representative body that is responsible for management of the water supply and sanitation services. The TOMs make regular visits to communities offering both technical and administrative advice through informal and hands-on training. The pilot project was judged a success, and in September 1995 SANAA launched the TOM program at a national level. The program operates out of SANAA’s six regional offices and two sub-regional offices, with funding and management support provided by USAID.

Honduras forms part of the Central American isthmus, sharing borders with Guatemala, El Salvador, and Nicaragua. It is a mountainous country—three-quarters of the land has a gradient of 30 degrees or more—with an abundance of water resources and 19 major catchments. The national territory extends to some 112,492 km<sup>2</sup> divided into 18 departments containing 297 municipalities, 3,730 villages, and 27,764 hamlets. The total population is currently estimated at six million<sup>13</sup>, of which approximately 53% live in rural areas.

**Table 1: Key Socioeconomic Indicators**

Indicator	Data (year of data)
GNP per capita	US\$ 722 (1995)
External debt	US\$ 4,343.5 million (1995)
Rate of inflation	29.5% (1995)
Literacy: National	77.2% (1994)
Rural	71% (1994)
Infant mortality	42 per 1000 live births (1996)
No. 1 cause of infant mortality	Acute respiratory infection 23% (1996)
No. 2 cause	Diarrhea 21% (1996)
Life expectancy: Urban	Men 68 years, Women 71.2 years (1997)
Rural	Men 64.4 year, Women 67.7 years (1997)
Human Development Index	116 out of 175 Countries (1997)

Sources: Various, including PAHO, UNDP Development Index, and Ministry of Health.

Before the devastation caused by Hurricane Mitch in October 1998, approximately 63.2% of households in rural communities had piped water connections (see Table 2), and 49.5% had access to sanitation facilities (latrines). Upwards of 1,600 piped water systems, of the

<sup>13</sup> The most recent population census was carried out in 1988.

total 4,166 systems, were damaged as a result of the hurricane. In addition, an unknown but substantial number of community wells and household latrines were also damaged.

**Table 2: Rural Water and Sanitation Coverage in Honduras**

<i>Type of Service</i>	<b>Population Served*</b>	<b>% of rural pop.</b>
<b>Water Supply</b>		
Piped service with household connection	2,014,816	63.2
Piped service with public tap stand	207,220	6.5
Public well with handpump	127,520	4
Public well without handpump	140,272	4.4
Purchased from tanker truck or similar	19,128	0.6
Use unprotected sources	679,044	21.3
<b>Sanitation System</b>		
Pour-flush latrine	615,284	19.3
Simple pit latrine	962,776	30.2
Without sanitation	1,609,940	50.5

\* Total rural population is 3,188,000.

During the early 1990s Honduras entered a phase of structural adjustment, similar to that of other countries in the region. The decision to modernize the state structures included SANAA, which began to put more emphasis on service operation and administration rather than extending coverage. The Municipal Law passed in 1992 transferred certain powers and authority to local governments, and the municipalities began to request that SANAA transfer the administration of sanitary services. SANAA resisted this shift for a number of reasons:

- SANAA would have reduced responsibility and importance,
- Transfer of the administrative power required a government decree, and
- More than 200 municipalities, described as semi-urban, were not viewed as having the technical capacity to administer the services.

In 1994 a major change occurred in SANAA's administrative staff, with the incorporation of economists and administrators in place of engineers. The new administration introduced a commercial outlook to the institution, partly because SANAA was no longer permitted to negotiate funding that would increase the external debt. SANAA was limited to its own resources or donated funds. Between 1994 and 1998, USAID provided virtually all of the external funding. This period coincided with a significant transfer of authority to the regional offices and the beginning of a more commercial approach to service delivery. Regional managers received training in business administration with the aim of making the urban water and sanitation systems financially viable. In 1997, the results of the restructuring were evident as SANAA was no longer in deficit. Since 1998, SANAA has renewed its emphasis on technical administration but has retained the commercial changes in service operation.

SANAA's current rural water and sanitation strategy is based on a permanent relationship with the communities and, specifically, with the water boards. During the construction

phase of new or rehabilitated systems, SANAA's Environmental Health Technician (*Técnico de Salud Ambiental* or TSA in Spanish) provides initial training to the community and water board. This training covers system operation, administration, maintenance, protection of the micro-watershed, and basic hygiene and sanitation. Towards the end of the construction process, the TSA introduces the community to the TOM responsible for O&M in that district.

The water and sanitation sector in Honduras includes diverse state institutions, international organizations, and NGOs. It is currently organized in the following manner:

The *sector leader* is the Ministry of Health (MOH), charged with responsibility for sector planning, establishing policy (including water quality), standardizing construction and operation practices, and financial planning. However, some observers point out that in reality SANAA has been responsible for many of these functions.

*Regulation* is the responsibility of CNSP (National Commission of Public Services), but it appears to be ineffective because it lacks adequate legal authority and clear definition. CNSP has a board of directors and is not part of the MOH.

*Implementation* of both urban and rural projects is carried out at the state level by SANAA and the MOH. It is expected, however, that pending legislation will soon end this aspect of MOH responsibility. A substantial number of new projects are being built by NGOs, the vast majority of which are destined for rural communities, though some peri-urban development is also under way. The most active NGOs in the water and sanitation sector are CARE, Catholic Relief Service (CRS), Save the Children Honduras (ASCH), and Agua para el Pueblo. The private commercial sector also develops urban and rural systems with financing provided by FHS (Honduran Social Investment Fund). The municipalities implement a few projects as well but are mainly concerned with developing sewerage systems for the municipality itself. Despite all these specially funded projects, the majority of new systems being built (urban and rural) are constructed by the state, principally through SANAA.

*Coordination* of the sector has been the role of the *Grupo Colaborativo*, a national steering committee. The organization was formed unofficially in the late 1980s and was recognized by presidential decree in 1994. It consists of a 12-member executive committee chaired by the MOH, and has equal representation by the public sector, international organizations, and private development organizations. A further 135 institutions are associated with the *Grupo Colaborativo*, whose main objectives are to:

- Support the MOH in the coordination of inter-institutional activities in the water and sanitation sector;
- Contribute to the elaboration of a national plan for water and sanitation; and
- Work towards the achievement of the aims established for water and sanitation, thus improving the sanitary conditions in Honduras.

*Operation and maintenance* of water and sanitation systems, whether urban or rural, is essentially the responsibility of the system operators. Currently, there are three main organization types that administer these services:

- The urban division of SANAA administers the water systems of the 39 principal cities, including Tegucigalpa but excluding San Pedro Sula and Puerto Cortes (respectively the second city in importance and the main port). Total population served is approximately 1,800,000.
- Municipalities administer 169 water systems, the majority of which consist of the municipal water systems themselves. Total population served is around 1,481,821.
- Community water boards in rural areas manage 4,023 water systems, serving a total population of over 2 million. SANAA provides operation and maintenance support to communities with piped water systems through the TOM program. For communities dependent on wells fitted with handpumps, the MOH is nominally responsible for their sanitary condition.

*Sector financing* is provided from a wide variety of national and international sources, the most important being:

- The central government national budget allocated to MOH and SANAA;
- International credit such as the World Bank, Inter-American Development Bank (IDB), and KfW (German development bank), channelled through FHIS;
- International development organizations, such as UNICEF, USAID, European Union, and Swiss Agency for Development and Cooperation (SDC) among others. This funding is channelled either through state institutions or NGOs.

The law governing the water and sanitation sector is currently undergoing review, and the new “Law for the Institutional Framework for the Water and Sanitation Sector” is expected to be passed by Congress later this year. The main objectives of the law are to:

- Improve service efficiency,
- Increase service coverage,
- Ensure that current service levels are sustainable,
- Generate financial sufficiency for operation and maintenance, and
- Redefine sector planning and organization.

Although the main structures in the sector will remain, responsibilities will be reorganized and better defined. The most significant of these changes will include the following:

- MOH will continue to be the lead agency. Its principal responsibility will continue to be the formulation of national water and sanitation policy. It will also establish appropriate strategies, objectives, regulations, and standards that will guide the operation of water and sanitation services according to the Health Code.
- A new regulatory commission (yet to be named) will have legal authority to enforce regulations and technical standards. It will oversee and advise on the granting of

concessions for system operation. The commission will continue to be a decentralized entity within the MOH.

- SANAA will cease to be a service operator; ownership and management of systems it currently operates will be transferred to municipal governments. SANAA will be responsible for developing rural water supply, including the training of water boards for operation, administration, and maintenance of their systems. SANAA will establish norms for the technical design, construction, and operation of water and sewerage systems, non-piped sewerage systems, and domestic and industrial wastewater treatment.
- Municipalities may choose to operate water and sanitation systems directly or offer a concession to a private or public organization. On request from municipalities or user organizations SANAA can provide technical assistance for the design, construction, or operation of water utilities.

The Framework Law will be followed by a complementary “Law of Water Resources,” which is currently being drafted. It is intended to provide clear guidelines on responsibilities for protection of watersheds, groundwater extraction, and surface water management.

## 2. Scope of Services Provided

Honduras has a wealth of spring and stream water sources which are ideal for gravity-fed systems. Implementing agencies and communities clearly prefer to build gravity-fed piped systems with household connections. Such systems have definite advantages over other systems: lower capital cost, technically simple to operate and maintain, low cost of operation and maintenance, and, frequently, 24-hour service. It is not always possible to build gravity-fed systems, however; other systems commonly used in rural areas include:

- Combined pumped/gravity-fed systems (electric, gasoline, or diesel) with piped distribution to households and/or standpipe connections, and
- Handpumps on boreholes or hand-excavated wells.

The choice of sanitation technology in rural communities is limited to either the pour-flush or simple pit latrine, depending on water availability. Although implementing agencies usually provide training in the use and upkeep of latrines, maintenance is left entirely up to the householder because of individual ownership.

The TOM program offers backup O&M support to all rural communities that have piped water systems with household connections. The program is not limited to systems built by SANAA, and consequently a substantial proportion of the rural population receives support. Specifically, the TOM program covers approximately 4,023 rural water systems (gravity-fed and combined pumped-gravity systems), serving over 2 million people (see Table 2). Other water system types, such as handpumps or standpipes, are excluded partly because the program concept was designed for systems which provided individual



household service and attendant responsibility for payment. SANAA believes that a significantly different approach for backup support is needed for systems that depend more on collective responsibility. A further reason is that with very few exceptions, SANAA has only built water systems with household connections. Thus, it is argued that its institutional competence does not extend to other types of water system. Responsibility for these other types of water systems is nominally that of the MOH.

In Honduras there are relatively few technical issues that affect water system design and construction. Probably the most challenging problem is that of deforestation which is occurring at the rate of 108,000 hectares per year. It has been estimated that the country could become completely deforested in 25 years. The loss of tree cover has led to a deterioration of surface and groundwater sources in terms of flow rates and quality.

The most significant single event affecting water and sanitation services in recent years was the destruction caused by Hurricane Mitch in October/November 1998. Substantial damage was done in both rural and urban areas to virtually all categories of infrastructure: water and sanitation systems, schools, health centers, housing, roads, electricity, and telephone services. The cost of reconstruction was estimated by the World Bank to be in the region of US\$ 2 billion. Water and sanitation coverage in rural areas is still estimated to be several percentage points below pre-Mitch levels; by the end of 2002, it is expected that this ground will be regained.

### 3. TOM Program Management and Organization

The vast majority of rural water systems are managed by community water boards, which are usually the product of institutional involvement during system construction. Typically they have between five and seven members elected by the community in a general meeting for two-year terms. Although most institutions encourage communities to aim for an equal number of men and women, this rarely happens; water boards are usually dominated by men. The water board either handles system operation itself, or it may contract a community member to work as system operator. The decision to contract an operator depends on the size of the community, the level of community organization and wealth, the type or complexity of the system, and which institution partnered with the community to develop the system. SANAA policy is to encourage all communities to contract a system operator.

Community water boards usually collect a monthly tariff, the amount having first been agreed to in a general community meeting. The income covers some or all of the following costs:

- Repairs or servicing of pipes, valves, pumps, motors, etc.
- Stationery
- Chlorine
- Electricity or other fuel
- System operator salary
- Per diem for water board members when travelling on water system business

- Savings for large-scale repairs or system extension/improvement.

The way the water boards function can vary greatly between communities. For example, some meet on a regular monthly basis to review the accounts and decide on an action plan for the following month's tasks, whereas others meet only when there is a problem. In some water boards, all members participate actively, and in others, only one or two people assume any responsibility. To a large extent, water board activity is determined by the size and complexity of the water system. Again, to highlight SANAA policy, the aim is to encourage full and regular participation of all water board members and regular reporting to the community.

The TOM program is viewed as a working partner to the community water boards and aims to support and sustain rural water systems through appropriate operation and maintenance. The basic job description of the TOM is:

To promote, organize, and manage the processes of education and community participation for the operation, administration, and maintenance of water and sanitation systems.

Applicants to the TOM program must be males, 20-30 years of age with a pre-university qualification in social work or primary education. New recruits receive an intensive 12-week training program which they must successfully complete before being accepted onto the program. The training program consists of theory and practical work in the following themes:

- Community motivation and participation
- Educational communication
- Water and sanitation concepts
- Basic technical concepts
- Water system construction and components
- Topography
- Engineering plans
- Water system operation and maintenance.

The TOMs' role is to support the community water boards in every aspect of system operation, administration, and maintenance by providing informal training and encouragement. An action plan for every community is drawn up based on its performance classification. (See Table 3 for a description of the four categories.)

The launch of the TOM program in 1995 at a national level coincided with the internal changes in SANAA's structure. Decentralization of authority to the regional offices has facilitated coordination of the TOM program with both the municipalities and NGOs. The latter are now able to request support from the TOM program at the regional offices of SANAA instead of having to go to the central office, thus reducing bureaucratic delays and developing working relationships between regional offices and the local level. As an example of improved flexibility, municipalities and NGOs can request assistance for the

training of rural water boards for new or rehabilitated systems. A few rural municipalities have directly benefited from the TOM program through training of the municipal system operators. Although there are no formal agreements, SANAA and the municipalities have a mutual interest in cooperation. Municipalities are legally responsible for local development, so there could be some political gain to facilitating the activities of the TOM program. Municipalities could supplement SANAA's limited resources by providing support for fuel or training facilities.

The initial strategy of the new TOM program was to produce an inventory of all the piped rural water systems and then carry out an in-depth evaluation of each system to determine its operational status and classification. (After Hurricane Mitch, the program decided to repeat this exercise to determine the impact on rural water systems.) The number of systems in the inventory was 4,023, as of March 2000; of these, some 3,961 or 93.1% have been classified. Data collected during initial classification and follow-up visits is entered into a specifically designed database: SIAR (Rural Water Information System). SIAR contains detailed information about every water system in the inventory and has proven to be a very useful planning tool. The central office of SANAA maintains SIAR, and the regional offices can access their particular data via computer.

**Table 3: Water System Classification and Respective Remedial Action**

<b>Category</b>	<b>Description</b>	<b>Action</b>
A	All the physical components of the system are working well. The water board meets regularly. Tariffs are fixed, are adequate, and are collected. The water supply is being chlorinated, and water quality standards are met. There is continuous or regular service.	Motivate the water board to continue the good work.
B	The system may or may not be functioning. There are operational problems that can be resolved without major investment. With minimal effort on the part of the TOM, the system can be moved up to "A" category.	Work together with the water board to resolve the minor problems in administration, operation, and maintenance.
C	The system may or may not be functioning. There are operational problems, and there may be technical problems with the water supply. Moving the system up to "A" category could require certain investments which are within the economic capacity of the community.	Work together with the water board to resolve the minor operational problems. Advise the board on the necessary system improvements, and their cost, in order for the community to raise the required capital.
D	The system is not functioning. There are many problems. Moving the system up to "A" category requires substantial investment, probably greater than the economic capacity of the community.	Report the situation to the regional SANAA office. There is little that can be done by the TOM.

It should be noted that the four categories are not considered progressive stages through which a system must move. The objective is to move a system directly to the "A" category without passing through any other intermediate categories.

The initial classification of a water system usually takes one or two days depending on the size of the system and distance from the regional office. The classification process involves gathering data on the following areas:

- General information concerning the community, water system specifications, and water board organization;
- Administrative and financial information, including tariff level, summary of income and expenditure, balance or deficit;
- Technical information regarding water source, pipeline length and diameter, flow rates, micro-watershed condition, maintenance schedule, and sanitation system.

If the system is in “B” or “C” category, the TOM plans activities to move the system up to “A” category. The TOM and the water board agree on a date for a follow-up visit to begin the training or supervision of improvements needed. It should be noted that the TOMs do not carry out the repairs themselves but rather offer advice on how to go about the task. In some communities a minimum of effort on the part of the TOM is needed to move the system up to the “A” category. For example, the water board may need reorganizing or training in bookkeeping. In such cases perhaps just one follow-up visit is all that is needed. In other communities the TOM may identify several problems that require a series of visits in order to reach the “A” category. Once a system has been assigned to the “A” category, the water board is presented with a SANAA diploma recognizing its achievement. The TOM organizes a community meeting to provide motivation to the water board members in the presence of their fellow community members. The diploma is renewed if the water system is classified in the “A” category in the following year.

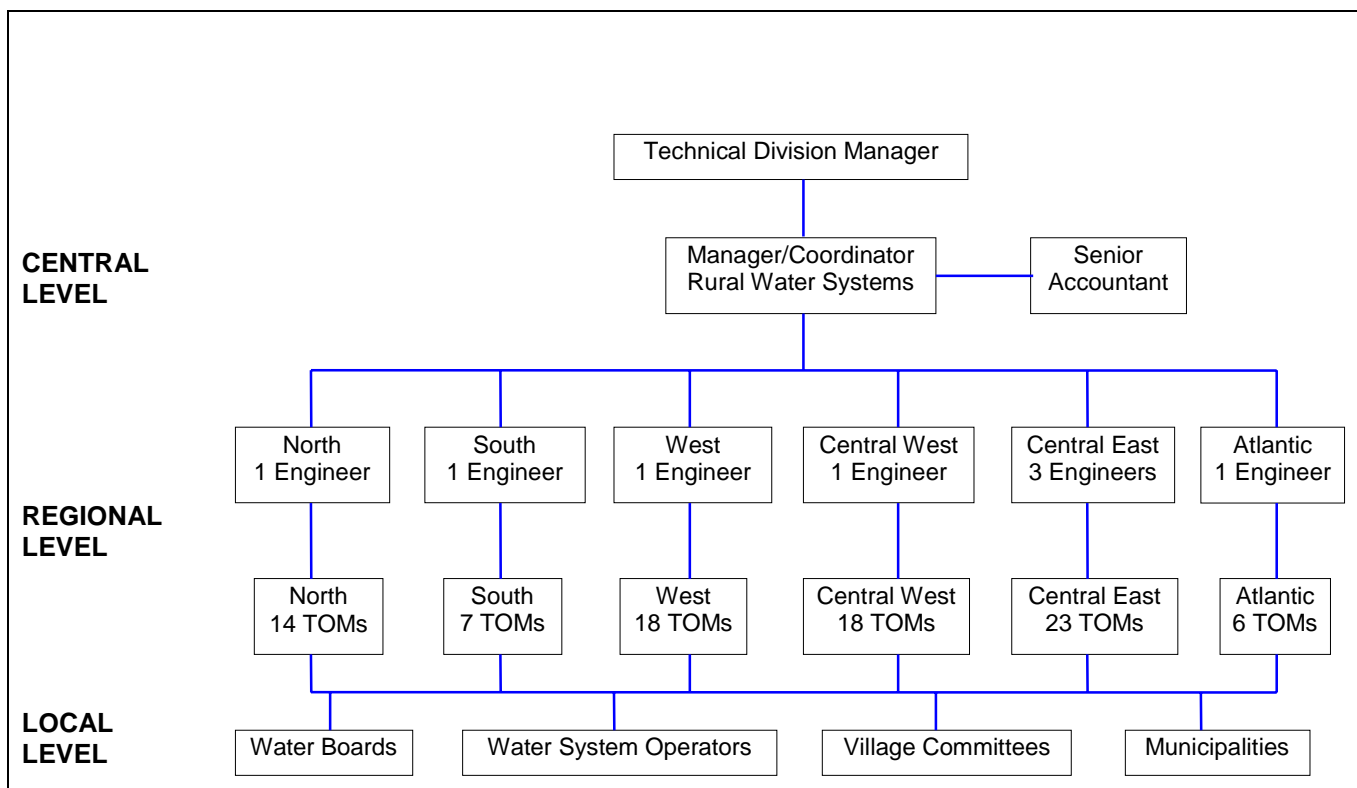
Each TOM is responsible for an average of 50 water systems and is expected to visit each system at least twice a year. However, they are encouraged to allocate their time according to need, so the TOM may plan to spend several days in a particular community or visit weekly in order to develop a series of activities.

As mentioned above, the TOMs provide informal training to the water boards in all aspects of managing the water system. Training takes on a more formal approach only for specific technical topics, such as chlorination of the water system or protecting and delimiting the micro-watershed.

Another aspect of the TOM’s work is conflict resolution. Conflict in communities can take many forms; the advantage for the individual technician is that he is seen as the representative of an institution with certain authority in water-related matters. The TOM may meet up with conflicts that are internal to the community, such as challenges to the water board’s authority, or external, such as disputes over ownership of water resources or micro-watershed use.

The head office or central level of the TOM program has just two full-time staff, though there are several other support staff with responsibilities for the program as well as for other divisions or sections. The latter include, for example, accountancy, education/training, and managerial personnel. The majority of personnel are based in the regional offices as illustrated in Figure 1.

**Figure 1: Organigram of the TOM Program**



The TOM program does not have any formal relation with other government agencies—a situation open to criticism. Some argue that there should be close coordination between the SANAA TOM program and the MOH promoters, SANAA and MOH being the two most important institutions with responsibility for water and sanitation and public health. The MOH has over 1,000 promoters, many of whom are equally well trained in water quality, chlorination, and environmental health promotional activities.

Private sector involvement in O&M of rural water systems is limited to supplying necessary materials or technical services. For example, when a community needs to carry out system repairs or improvements, the necessary materials are purchased from commercial suppliers. As a state institution, SANAA is not allowed to sell materials that have been purchased through public finance.

#### 4. Financing and Cost Recovery

In the majority of communities a monthly tariff is levied on the users to cover recurrent costs. The tariff level depends on several factors:

- System type and condition,
- Number of users,
- The extent to which the community is organized,
- Economic circumstances within the community, and

- Influence of external institutions.

Clearly, the tariff issue is pivotal for sustainability of rural water systems. In the TOM program, for a water system to be classified in the “A” category the tariff level must be considered “adequate.” Tariffs are defined as “adequate” if *all* recurrent costs are covered. SANAA interprets recurrent costs to include the purchase of chlorine. However, in rural areas there is considerable resistance to using chlorine. Thus, there are many “B” category water systems that are covering recurrent costs of maintenance, administration, and even have a savings component but are not chlorinating. Although these systems are financially viable and technically sustainable, they are not considered in the “A” category because consumption of non-chlorinated water is a public health risk.

In the case of a community not charging an adequate tariff to carry out preventive maintenance, the system deteriorates until service is interrupted. At that point, the usual response is for the community to look for external assistance (technical and financial). If the repair does not require major expenditure, the community will usually agree to a one-time payment to put the system back into service.

Establishing an adequate tariff level is undoubtedly one of the most difficult issues to tackle in rural communities. The TOMs advise the water boards on how to calculate the tariff level and will support the board in a community meeting if it is agreed that an increase is needed. The TOMs recommend that the tariff include a savings component to enable the community to cope with major repairs or system extension.

The tariff problem is best described as cultural; for generations communities were accustomed to water being supplied from an unprotected source such as a stream or spring, for which they were never asked to pay. The development of a water system is a major event in most rural communities, but the concept of paying for water is not readily understood. Some development programs still require only minimum financial participation of the community or even pay community laborers to build their own water systems. These practices encourage the expectation that water service comes free. A major challenge for the TOM program is to bring about a change of attitude in the communities about the value and costs of operating a water system.

To date, the TOM program itself has been funded jointly by SANAA and USAID. The total budget for the year 2000 is Lps.18.4 million<sup>14</sup> (US\$ 1.25 million), provided in the following proportions:

- SANAA--Lps.12 million, assigned to salaries and program administration costs.
- USAID--Lps.6.4 million, for operational costs including fuel, per diems, equipment maintenance, and technical studies. In addition to the USAID financial contribution, several new vehicles and motorcycles have been donated in this financial year.

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<sup>14</sup> Lps. = Lempiras. US\$1 = Lps.14.7 (May 2000)

The current reliance on external funding for the TOM program is not a sustainable policy. SANAA has begun considering ways to finance the program. Three main options have been proposed:

- Transferring the program to the municipalities. This is seen as a long-term option as the municipalities do not yet have sufficient experience in water and sanitation management.
- Charging communities a proportion of the costs, with the central government paying the main share of the budget. There is little enthusiasm for this approach because of the difficulties of enforcing payment by communities. In addition, SANAA has had limited success in the past when rural communities were charged for maintenance in the joint SANAA/IDB program.
- Exclusive financing by the central government. This option is considered to be the most feasible in the medium term. However, it will require clear political commitment to the program on the part of SANAA and the government.

Currently, all capital investment is provided by central government or through national and international aid programs. From 1990 to 1995, the combined annual spending (national and external resources) for rural water supply in Honduras was US\$ 89.3 million, and US\$ 15 million in rural sanitation. Respectively, this represents 46% and 20% of the total sector spending in water and sanitation.

## 5. Legal and Regulatory Framework

The current legal and regulatory framework that applies to SANAA and other institutions involved in the water and sanitation sector is rather vague. For example, the boundaries of responsibility between SANAA and the MOH are not adequately defined. Although this lack of legal clarity does not appear to affect the ability of the program to function effectively, there are no legal requirements that it should meet certain standards or provide certain coverage. The Framework Law before Congress includes an article that SANAA will be responsible for "...developing rural water supply, including the training of water boards for the operation, administration, and maintenance of the water systems."

This clause can be broadly interpreted to mean that SANAA must continue to offer backup support to communities through the TOM program or something similar. It would also appear to suggest that SANAA will become responsible for communities with water systems other than those that offer household connections. Thus, SANAA would be obliged to provide backup support to all rural communities with whatever type of water system.

However, other legal issues remain unresolved and continue to limit the effectiveness of the program. For example, the vast majority of water boards do not have legal status (*personalidad juridica*), i.e., there is no legal recognition of the water board as the system operator. The actual ownership of the water systems has to date been a non-issue. Water systems built by state funding are legally state property, whereas in the case of systems built by private development organizations, the system is donated to the community. In both situations, however, the community is viewed as the system administrator. The main

impact of legal status is the introduction of accountability and ability to be regulated by the state. The water board could then theoretically be prosecuted if it did not fulfill the legal standards related to water system operation.

Another problem area is the ownership of micro-watersheds. The program encourages communities to reforest, delimit, and purchase the micro-watershed wherever possible. However, the program has little recourse in law to enforce micro-watershed protection.

## 6. Environment and Health

The TOM program does address certain environmental and health concerns, but its promotional efforts concentrate on issues that relate directly to moving the systems into the “A” category. For example, water system chlorination and cleaning are emphasized as they are essential for the system to be classified in the “A” category. Micro-watershed protection is also given considerable importance, and its condition is reviewed on routine visits. In some regional offices, program funds have been allocated to carry out educational campaigns on micro-watershed protection and management.

It appears that limited resources restrict the program’s capacity to pursue environmental and health education activities more vigorously. The TOMs are expected to advise water boards on such issues as latrine coverage and household wastewater drainage; it is assumed by the TOMs that the key health messages will be passed on to other community members.

Health education activities are a relatively minor component of the TOM program. Although there is no formal coordination between the MOH promoters and the TOMs, the MOH has primary responsibility for health education and monitoring of public health indicators in rural communities.

## 7. Performance

Overall performance can be evaluated by the number of communities that moved into “A” category. The target for 2000 was to have 30% of communities in “A” category, and by the end of 2001, 50% in that category.

Table 4 indicates progress to date. Although there is too little data on which to perform any kind of statistical analysis, an overall trend shows a progressive increase in the proportion of systems in “A” category. However, the information in the table doesn’t specifically show the effects of Hurricane Mitch; September 1999 is the first quarterly report available following the hurricane—about 10 months later. Nevertheless, it is clear that the number of systems in categories “A” and “B” are still significantly lower than the figures immediately prior to the hurricane. In June 1998, 2,426 systems fell into “A” or “B” categories, whereas the comparable number in September 1999 was 1,591.



**Table 4: Water System Classification between December 1997 and March 2000**

Quarterly Report Date *	No. of systems in inventory ** (% classified to date)	Category No. (%)			
		A	B	C	D
December 1997	3,942 (78%)	268 (8.7)	1863 (60.7)	752 (24.5)	186 (6.1)
June 1998	3,994 (93%)	293 (7.9)	2133 (57.5)	893 (24.1)	391 (10.5)
September 1999	3,983 (72%)	251 (8.7)	1340 (46.7)	843 (29.3)	439 (15.3)
December 1999	3,961 (84%)	392 (11.7)	1575 (47.2)	1033 (30.9)	340 (10.2)
March 2000	4,023 (93%)	567 (15.1)	1635 (43.6)	1146 (30.6)	399 (10.7)

\* Last and first reports available around Hurricane Mitch were June 1998 and September 1999.

\*\* Number of systems in the inventory increases because new systems are added. It decreases occasionally because duplications or classification errors are found.

A comparison of the June 1998 and March 2000 figures is particularly useful as the same proportion of systems had been classified. It can be seen that the number of systems in “B” category fell considerably, while both “A” and “C” categories increased. This can probably be attributed to the emphasis placed on moving “B” systems up to “A” and the damage to water systems as a result of the hurricane. The proportion of systems in “D” category barely changed, further supporting the finding that the program is performing well.

It is worth reiterating the significance of the “A” category, namely that the water system is functioning correctly on the basis of technical, financial, commercial, and environmental health criteria. On the basis of these criteria only 15.1%<sup>15</sup> or 567 rural water systems are considered to be working satisfactorily.

A further 43.6% of systems, those in the “B” category, are functioning well technically, and a proportion<sup>16</sup> of these systems are also fulfilling the financial criteria. Table 5 illustrates the regional differences in the proportion of water systems that are classified in the “A” category. These variations reflect different socioeconomic conditions, ease or difficulty of access, and performance of the individual regional offices.

**Table 5: Regional Analysis of Water Systems in “A” Category, by report date**

Region	Dec 97	June 98	Sept 99	Dec 99	March 2000
	<b>Number of Systems in “A” Category (% of classified systems)</b>				
North	9 (2%)	31 (6%)	5 (5%)	14 (5%)	14 (4%)
South	13 (6)	2 (1)	49 (18)	57 (20)	67 (23)
West	56 (9)	80 (10)	113 (12)	135 (14)	183 (18)
Central West	27 (4)	93 (10)	15 (3)	74 (8)	121 (13)
Central East	82 (10)	69 (8)	43 (6)	75 (12)	144 (17)
Atlantic*	81 (36)	18 (7)	26 (9)	37 (13)	38 (13)
<b>Totals</b>	<b>268 (8.7%)</b>	<b>293 (7.9%)</b>	<b>251 (8.7%)</b>	<b>392 (11.7%)</b>	<b>567 (15.1%)</b>

\* The TOM pilot project was implemented in the Atlantic region.

<sup>15</sup> 15.1% of those systems classified by March 2000, i.e. 3,747 systems classified

<sup>16</sup> Obtaining the exact proportion would require that the file for each community be examined. The SIAR database does not currently allow such detailed search criteria to be selected.

## 8. Factors That Contributed to Success

The success of the TOM program is based on several factors, the most important of which are described below:

- *The model concept*, based on providing advice, training, and motivation of the water boards in situ, is an effective strategy for developing management capacity. With few exceptions, the water system is the only public service managed by the community, hence there is little or no experience in administering such services.
- *The classification system* from “A” to “D” is simple and easy to manage, enabling the TOMs and regional engineers to plan training activities according to individual community needs.
- *The SIAR system* provides SANAA with detailed information on the status of all the rural piped water systems. It facilitates the development of medium- to long-term operation and maintenance strategy, and helps identify common problems and regional performance.
- *Regular visits* by the TOMs help the water boards to keep on top of preventive maintenance and preclude minor problems from developing into major ones. An important aspect of the TOMs’ routine visit is motivation of the water boards. The latter can count on an institutional ally to back them on potentially unpopular decisions, such as increasing the monthly tariff.
- The TOM program has *relative autonomy* in the sense that there is little political gain to be made from interference in the program management. Even at the local government level, political interest in tinkering with the program is likely to be minimal as no material resources are at stake. Although a few municipalities have provided some resources to facilitate TOM program activities, the political benefit is limited to adding credibility to their local development responsibility.
- *Decentralization* to regional offices improves the efficiency of the program by making it more accessible to the communities and municipalities. This devolution has also introduced an element of competition between the municipalities or communities as quarterly results are made available to all the regional offices.
- *Operational flexibility* is provided for program management. The regional engineers are at liberty to manage the TOM program according to how they think they can best achieve the aims. Similarly, the TOMs can plan their visits and allocate time to each community on the basis of need.
- *The personal and educational qualities of the TOMs* themselves is another major factor for the success of the program. The educational criterion for recruitment is a pre-university qualification in social work or primary education. In addition, the candidates

must successfully complete a 12-week training course before being accepted onto the program.

- *The provision of resources* (such as vehicles, motorcycles, and educational materials) and availability of water quality laboratories and equipment (such as altimeters, chlorimeters, and GPS) also contribute to the efficiency and success of the program.
- *Salaries* of the TOMs are generally better than those of other state promoters or technicians; the use of a motorcycle during work hours also carries a certain amount of status.
- *USAID support* has been fundamental to the program. The original concept was *developed* by USAID; but since its inception, USAID has played an advisory role rather than a managerial one. This approach has facilitated the perception of the TOM program as a national program.
- *USAID funding* initiated the program and has contributed to its success and stability. SANAA has had considerable leverage in requesting program funding for the program from the Ministry of Finance as a direct result of the steady USAID support. The counter argument *remains*, however, that as the program is in its fifth year, national funding should by now fully cover the total budget.

## 9. Prospects for Long-term Sustainability and Replicability

The long-term sustainability of the TOM program will be determined by three interlinking factors:

### A. National Political and Financial Commitments

A clear political commitment to the program is fundamental for its long-term prospects. The question of commitment is relevant to both the executive management of SANAA and the central government. As a precondition, SANAA must fully embrace the program in order to present a strong case for allocation of resources from central government. A significant issue within SANAA is the distribution of resources between rural and urban divisions, as well as between new construction and O&M. At the central government level there is political pressure to increase access to water and sanitation. Thus, a rural maintenance program is not seen as a vote winner.

An important question to be asked in the political context is this: Is the program affordable? In the short term, it is difficult to produce figures that clearly demonstrate that it is cost-effective. To perform such an analysis, an estimation would need to be made of the number of water systems that would have gone out of service had they not received program support. It is possible, however, to calculate the annual cost of the program per user (Lps.9.20 or US\$0.62) as it serves some 2 million users. Aside from the investment value

of water system infrastructure, a valid analysis should also consider the public health cost in terms of mortality and morbidity exacerbated by defective water supply. When considering how such a program should be financed, it is worth pointing out that the NRW program receives 90% of its annual budget from the U.S. government; the balance comes from membership fees and/or other local income.

Prior to Hurricane Mitch, the number of TOMs had been dwindling because sufficient resources were not committed by the SANAA management. Although the staffing situation is now much improved, there have been bureaucratic delays in allocating resources to the regional offices, indicating that there is still less than full commitment to the program. The support received from USAID, the most important aid donor to the water and sanitation sector, has undoubtedly added weight to the argument in favour of the TOM program. The issue of O&M support is a frequently discussed topic in meetings of the *Grupo Colaborativo*, and its members' opinions are also likely to influence SANAA's position.

### *B. Program Performance*

Program performance will clearly influence the level of political commitment, and good results are essential if the SANAA management is to be convinced that the program is cost effective. Unfortunately, there is a vicious circle as the apparent lack of commitment to the program results in demoralization of the field staff. Several of the TOMs interviewed stated that they are sometimes unable to agree on activities with the community water boards because of uncertainty about the availability of resources such as fuel and per diems. Compared to several decades of national and international investment emphasizing the development of rural water supply infrastructure, the TOM program is still very much in its infancy. Nevertheless, the program's track record to date is encouraging, especially if the effects of Hurricane Mitch are taken into account. As current efforts to rehabilitate hurricane-damaged water systems give way to the more usual development projects, the true capacity of the TOM program to support communities in O&M will become clear. Ironically it sometimes takes an event such as Hurricane Mitch to demonstrate the real value of this type of support mechanism.

The program certainly appears to be producing good results, and ambitious targets have been set for the proportion of rural water systems in the "A" category. However, some observers have suggested that 65% of systems in the "A" category may be a realistic maximum.

When considering the relatively small proportion of water systems currently in "A" category, several factors should be taken into account. The country suffered its worst natural disaster in November 1998, with widespread damage to upwards of 60% of the national stock of water systems. And although water systems in "B" category are unlikely to be chlorinated, they are providing service. It can be argued that household water supply, even if it does not meet WHO quality standards, contributes significantly to the mitigation of water-related illness.

A clear limitation of the TOM program is that it covers only piped water systems. In addition to the 4,000 or so piped water systems, there are more than a quarter of a million

rural inhabitants who depend on community wells for their drinking water; the question remains about how to provide support to those communities. As with piped water systems, community wells require regular maintenance, and water boards need training and motivation. The public health risk from an unsanitary well can be even greater than that of a piped water system because of the potential contamination focus.

### *C. Reform of the Water and Sanitation Sector*

Currently, MOH and SANAA do not coordinate their programs or planning efforts. The forthcoming “Law for the Institutional Framework for the Water and Sanitation Sector” will be a positive development by more clearly defining SANAA’s role in supervising rural water systems O&M. As a result, long-term development, planning, and commitment to the TOM program should become a high priority for SANAA and the state.

The annual cost of the TOM program is around \$1.2 million or some \$0.60 per user served. This is viewed by USAID and SANAA as a very reasonable cost, and they argue that a comparison should be made with the cost of replacing infrastructure that fails before reaching the end of its design life and in terms of lower health-care costs due to reduction in water-related illness. USAID is still funding nearly a third of the annual budget which raises a question about the long-term sustainability of the program. In the short term there appear to be few options available for financing the program when USAID support comes to an end. Although SANAA has considered several financing alternatives, it is likely that the only guarantee of continuity is for the central government to accept full budget responsibility. Again, the new Framework Law will help support that level of commitment as it makes SANAA responsible for providing administration and maintenance assistance to the rural water boards.

One of the important results of the TOM program has been the detailed information gathered regarding the condition of rural water systems at a national level. Based on data indicating that around 90% of the water systems are in the “A”, “B”, or “C” category, SANAA points out that the maintenance, or infrastructure repair in the case of “C” systems, is within the capacity of the communities. This data facilitates the planning and development of a strategy to provide appropriate maintenance support to the communities.

The overall impression formed through discussions with the community water boards is that they have benefited considerably from the training provided by the TOMs, the most common observation by the water boards being that they would like further training and more frequent visits from the TOMs assigned to their district. A frequently asked question is whether a twice-yearly visit is sufficient to ensure the adequate upkeep of rural water systems.

Convincing the rural population of the health value of chlorinated water is a major challenge to all institutions working in the water and sanitation sector. The other great challenge relates to the historical and cultural problem of having to pay for water service. Changing attitudes about chlorination and payment for service will inevitably take several years. It is essential that all institutions working in the sector reach policy consensus on these two critical areas.

There is considerable potential for further development of the TOM program. The ultimate goal shared by such programs is to ensure the sustainability of rural water and sanitation systems, with the end result being improved public health.

## Acronyms

AHJASA	<i>Asociación Hondureña de Juntas Administrativas de Agua y Saneamiento</i> (Honduran Water Board Association)
APP	<i>Agua para el Pueblo</i> , a Honduran NGO
APTOS	<i>Agua para Todos</i> (a private firm which provides water and sanitation backup support to communities in the department of Yoro)
CNSP	<i>Comisión Nacional de Servicios Públicos</i> (National Commission of Public Services)
CODEM	<i>Comité de Desarrollo Municipal</i> (Municipal Development Committee)
FHIS	<i>Fondo Hondureño de Inversión Social</i> (Honduran Social Investment Fund)
IRWA	International Rural Water Association, a committee of NRWA
MOH	Ministry of Health
NRWA	U.S. National Rural Water Association
O&M	operations and maintenance
PROSAR	<i>Programa de Saneamiento Rural</i> (Rural Water and Sanitation Project)
PROPAR	<i>Proyecto de Pozos y Acueductos Rurales</i> (a rural water and sanitation project, 1986-1997, supported by MOH and SDC)
SANAA	<i>Servicio Autónomo Nacional de Acueductos y Alcantarillados</i> (National Water Supply and Sewerage Company)
SDC	Swiss Agency for Development and Cooperation
SIAR	<i>Sistema de Información de Acueductos Rurales</i> (Rural Water Information System)
TSA	<i>Técnico de Salud Ambiental</i> (Environmental Health Technician)
TOM	<i>Técnico en Operación y Mantenimiento</i> (Technician in Operation and Maintenance)
WS&S	water supply and sanitation

# INSTITUTIONAL ARRANGEMENTS FOR RURAL COMMUNITIES PROSAR and AHJASA Programs in Honduras

Andrew Trevett

## Abstract

In addition to the TOM program, there are two other support mechanisms that offer operation and maintenance backup to the rural communities in Honduras. These important programs are briefly examined in this case study:

- PROSAR (Rural Water and Sanitation Project) managed jointly by the Ministry of Health and the Swiss Agency for Development and Cooperation
- AHJASA (Honduran Water Board Association) established by Agua para el Pueblo.

Under PROSAR, Environmental Health Technicians (*Técnicos de Salud Ambiental* or TSAs) are based in health centers in municipalities and are responsible for coordinating the construction of new projects, training, and backup support to communities with existing systems. PROSAR operates exclusively in 905 communities in two departments in Honduras. In the AHJASA model, circuit riders provide support to communities that are members of the association. This model operates in six departments and has a total membership of 300 communities.

Although resources did not permit the development of full case studies for these models, they are presented because they offer two somewhat different approaches to providing backup support to rural communities.

## 1. Introduction

This case study examines two other programs for providing backup support to rural communities in managing their water supply and sanitation (WS&S) systems. Both of them operate on a regional scale rather than a national scale, in contrast to the TOM program. The motivation for establishing both of these programs was similar: ensuring the sustainability of rural WS&S systems.

The programs discussed below are PROSAR (Rural Water and Sanitation Project), managed jointly by the Ministry of Health (MOH) and the Swiss Agency for Development and Cooperation (SDC), and AHJASA (Honduran Water Board Association), established by *Agua para el Pueblo* (APP), a Honduran NGO. The PROSAR project bases Environmental Health Technicians in health centers, while in the AHJASA model, circuit riders provide support to communities that are members of an association of water boards.

## 2. PROSAR

### *Background*

PROSAR is a rural water supply and sanitation (WS&S) project that aims to develop sanitary infrastructure and provide training in environmental health. It began operation in January 1998 and will end in December 2000. A follow-up project to PROSAR is currently being developed and is expected to commence in January 2001. The MOH and SDC have been collaborating in WS&S projects for rural communities in Honduras for more than 20 years.

PROSAR, developed from a previous project called PROPAR<sup>17</sup>, includes a specific component to provide communities with backup support for the operation and maintenance of the WS&S systems. The evaluation of PROPAR found that although training the water boards in water system operation and maintenance was essential, it was still necessary to provide ongoing support to the communities to guarantee the sustainability of the infrastructure. Such a support program was incorporated as an integral component of the new PROSAR project design. In addition to direct program support for rural communities, the proposal included plans to encourage the formation of water board associations and even an initiative for private sector participation to provide backup support to the water boards.

### *Financing*

PROSAR has a total budget of approximately \$1.3 million over the 3-year project period. The SDC contribution to the budget is around 69%, the MOH provides 25%, and the remaining 6% comes from diverse sources. The proportion of the budget given to the backup component of the program is not specified.

### *Area of Influence*

The project was designed to operate in the 905 communities within the 33 municipalities of the departments of Santa Barbara and Cortés. These municipalities form a part of “Health Region No. 3” as defined by the MOH. The feasibility study identified 210 communities as needing water systems; the remaining 695 had existing services built by other institutions. This latter group was targeted to receive training, education, and organizational support. Unlike the TOM program, PROSAR offers support to communities with water systems of any type. This reflects the PROSAR strategy of building diverse types of water systems, including piped systems with public standpipes and hand-dug wells or boreholes fitted with handpumps. PROSAR gives preference to construction of gravity-fed systems with household connections where technical and economic conditions permit.

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<sup>17</sup> MOH - SDC rural water and sanitation project in operation from 1986 to 1997.



### *Management and Organization*

Community support is provided through Environmental Health Technicians (in Spanish, *Técnicos de Salud Ambiental*, or TSAs). The 37 TSAs operate from the health centers in rural municipalities, and each is responsible for an average of 25 communities. Typically, the TSAs each manage around five new or rehabilitation projects, and the remainder of their time is dedicated to the support program. The TSAs are supervised by four Area Coordinators, who in turn are supported by technical and managerial personnel.

The operation and maintenance (O&M) model of PROSAR is founded on community visits by the TSA. There are four main mechanisms that lead to a community visit by the TSA:

- Direct community request for assistance from the TSA
- Routine visit to the community to conduct the required quarterly water quality analysis.
- Recommendation by the health center to which the TSA is attached for a community visit because of high illness incidence related to environmental conditions
- Request from the Municipal Development Committee (CODEM - Comité de Desarrollo Municipal) that the TSA visit a particular community.

### *Methodology and Strategies*

The PROSAR program initiates activities in a community visit by first carrying out a detailed evaluation of the environmental health situation. This is broadly similar to the SANAA classification survey, but in addition to a review of the management, operation, and condition of the water system, it also call for an assessment of refuse disposal. Having completed this evaluation, the TSA presents the results to the community in a general meeting (rather than to the water board). The TSA serves as a facilitator to help the community draw conclusions about the deficiencies of its water and sanitation systems. The aim is for the community to decide for itself any actions to be taken and to assign responsibility. PROSAR views community water boards as the service provider. Presenting the deficiencies to the entire community puts pressure on the water board to take action. At the general meeting, there is also an opportunity for the community to address other activities, such as improving refuse disposal or protecting the micro-watershed. The TSA will then offer training sessions related to the conclusions of the environmental health evaluation, for example, tariff-setting, protection of the micro-watershed, system chlorination, system maintenance, refuse disposal, etc. The TSA plans a series of visits with the community to carry out a training program. This usually takes the form of weekly visits to try to bring about rapid improvement. Once the training program is completed, the TSA continues to visit the community, initially on a monthly basis to ensure that training has been effective, and later on the basis of community requests or for quarterly water quality analysis.

Generally, the TSA responds quickly to a request to visit a community, unless the quarterly water quality analysis takes priority. These quarterly checks are given considerable importance. Water samples are processed at one of the four regional PROSAR offices. The TSA is responsible for sample collection and reporting the results to the community. The

sampling may be done by the TSA or the water board, having first received training from the TSA. An important aspect of the water quality control is that the TSA will present the results to the community in a general meeting. Again, the aim is to stimulate community action if the water quality does not meet MOH standards<sup>18</sup>.

An important PROSAR strategy is to support the CODEMs with environmental health advice and training by the TSA. As mentioned above, the CODEMS may pass on a request to the TSA to visit a community with water system problems. These municipal committees are formed by 7 to 10 of the most active community leaders, who work voluntarily with the mayor's office to manage and plan local development initiatives. The CODEMS were created as a response to the Municipal Law that imposes responsibility for local development on the municipalities. The bimonthly meetings take place in the municipal office and are attended by the TSA and municipal representative. PROSAR's strategy aims to strengthen the community/municipality links and the institutional capacity of the municipalities. A spin-off from the policy of collaboration with the municipalities has been the contracting of former MOH promoters to work directly for the municipalities as TSAs. Currently 10 municipalities from the areas covered by the PROPAR and PROSAR projects have taken on promoters to advise communities on water, sanitation, and environmental management.

The basic PROSAR model of providing backup support has also been adopted for use in communities that were originally covered by PROPAR. Without the additional resources provided by SDC, certain logistical difficulties have arisen, fewer training sessions occur, and there is only limited water quality monitoring. However, there have been some significant developments in the follow-up work to the PROPAR project that are important to mention. For example, 12 water boards from the municipalities San Manuel, El Progreso and La Lima have formed an inter-ministerial association. The aim is to organize its own O&M support system. Also of note, the association has elected a female president. Another important development has been the formation of a private enterprise known as APTOS (*Agua para Todos*) which offers water and sanitation backup support to communities in the department of Yoro. APTOS was established by six former MOH promoters who worked in the PROPAR project. Through municipal contracts, APTOS has provided services such as evaluation of community water system problems and water board training.

### **3. AHJASA**

#### *Background*

The origin of AHJASA dates to 1990 when a representative of the U.S. National Rural Water Association (NRWA) made a visit to Honduras to study water system problems faced by rural communities. Together with APP a study was undertaken to determine the principal problems faced by community water boards in maintaining their systems and, specifically, to measure the level of interest in forming an association of water boards. Although the study duration was planned for some 10 months, it was quickly established

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<sup>18</sup> The MOH standards are based on the WHO water quality guidelines.

that there was considerable interest in forming an association. In November 1990 AHJASA was formed, initially with 17 community members in the department of Valle.

A member of APP's staff was selected to coordinate activities with AHJASA and was sent to the United States for training in the basic concepts and principals of the NRWA. The concept of the circuit rider was first introduced to Honduras as a result of this training opportunity. The basic principals of the NRWA were adapted to Honduran conditions and the AHJASA membership was offered the advisory services of a circuit rider. The main objectives of AHJASA are to:

- Offer training to water boards in the administration and maintenance of water and sanitation systems
- Provide technical and organizational advice
- Facilitate mutual assistance between the AHJASA members

### *Financing*

The financing of AHJASA and the circuit riders is mainly provided by the International Rural Water Association (IRWA, the international committee of the NRWA). The annual budget is US\$ 38,000 of which approximately 80% is provided by IRWA, 15% by APP, and the remaining 5% by monthly membership fees. The latter are based on the number of system users per community. The membership fee is currently set at Lps.0.50 (approximately \$0.03) per user. Thus, for a community with 60 water system users the monthly fee is Lps.30 (\$2.04). Although the proportion of the total cost paid by the membership is small, it does provide incentive to the membership to participate in AHJASA and demonstrates that the water boards are expressing demand for backup support to better manage their water systems.

### *Area of Influence*

AHJASA currently works in six departments (Valle, Choluteca, Francisco Morazan, La Paz, Olancho, and Yoro) and has a total membership of around 300 communities. Membership is open to communities with any type of water system: piped (gravity or pumped), hand-dug wells, or boreholes. Although it would seem desirable to expand its membership, AHJASA is actually stretched to capacity, given its current budget.

### *Management and Organization*

The organizational structure of AHJASA could be described as part of the "bottom up" strategy. For each department where AHJASA operates there is a board of representatives elected from the community members. Similarly, there is a national board consisting of members elected during the annual general meeting. The management of AHJASA is largely the responsibility of the departmental and national boards. On a monthly basis the circuit riders present a summary of their activities to the departmental boards. The latter provide guidance to the circuit riders in terms of work priorities and requests from member communities for assistance with specific problems. The circuit riders are not given a target

number of communities to visit each month, but instead they are expected to respond to the demand and needs expressed by AHJASA members. At the national level, the AHJASA board, APP coordinator, and circuit riders meet periodically to decide on overall AHJASA strategy and aims.

AHJASA has very few salaried personnel: four circuit riders, each having responsibility for an average of 75 communities, one coordinator, and one administrator/secretary. The departmental and national board representatives of AHJASA participate on a voluntary basis.

### *Methodology and Strategies*

AHJASA has promoted a gradual increase in its membership by developing a set of services designed to support community water boards in better managing their systems. These services have been modified and improved according to demands from community water boards and problem diagnosis by the circuit riders. The benefits currently available to AHJASA members include:

- Technical support in resolving administrative and O&M problems
- Assistance in developing proposals for new systems or extensions
- The sale of bookkeeping and administration stationery at low cost
- The sale of replacement parts for various types of handpumps
- The sale of chlorine in granular form (65%) for system disinfection and solution (1%) for household water disinfection
- Provision of water quality analysis services, sanitary inspections, and risk analysis
- Preparation of documentation for application for legal recognition of the water boards.

Similar to the TOM program, AHJASA circuit riders provide hands-on training to the water boards through regular visits to the communities. If a training or technical problem is beyond the capability of a circuit rider, he will ask for assistance from another circuit rider, engineer, or other specialist. Training is offered to the community water boards on the following subjects:

- Water system operation, maintenance, and administration
- Management of the micro-watershed
- Maintenance of latrines and sanitary education
- Bookkeeping and maintaining bank accounts.

Training is provided both informally during individual community visits and formally in group sessions, when funding is available. New AHJASA members receive training in all of the above topics to equip the water board with the basic knowledge needed to manage the water system. Once a water board has received the basic training modules, further training is carried out when requested or when community elections result in new water board members.

An important strategy of AHJASA is for the circuit riders to make routine community visits, during which they can advise on technical and administrative problems. If necessary,

follow-up visits can be planned. The circuit riders also respond to requests from water board members that contact the APP or AHJASA offices. Visits are also made to some communities simply because of the lapse of time that has passed since the previous visit. For example, if the community record indicates that no contact has been made for a period of months, the monthly schedule for the Circuit Rider will include that community.

Occasionally the circuit riders are asked to get involved in conflict resolution relating to a problem with the water system. Typical examples include contamination of water sources by unregulated agricultural practices, disputes over water source use, and nonpayment of monthly service tariffs.

The objective of fostering mutual assistance is one of the most significant differences between water board associations such as AHJASA and the TOM or PROSAR programs. Water board associations such as AHJASA contribute greatly to developing the management capacity of community water boards. During training seminars attended by several water boards or in departmental board meetings, there is an opportunity to compare notes on local experiences and to discuss problems and their solutions. This process is thought to be very effective for promoting the self-confidence of water board members, leading to better water system management and further improvement.

#### 4. Summary

The most significant difference between PROSAR and AHJASA, aside from the scale of the programs, is their basic strategies. In the case of PROSAR, a “top down” approach is taken, whereas AHJASA is rooted at the community level and adopts more of a “bottom up” strategy. The latter is attractive as it exemplifies the current preference for demand-led development. However, the PROSAR approach also has advantages as professional management of the program contributes to its effective and efficient implementation. Furthermore, PROSAR uses participative techniques to involve the community in decision-making and problem-solving.

The programs also contrast in their focus on approaching the problem of supporting community development. AHJASA takes a narrow focus, concentrating its efforts on the technical and administrative problems of managing the water system, whereas PROSAR takes a more holistic view by treating water system O&M as just one element of preventive public health care.

Both programs emphasize capacity-building through training. Water quality analysis is also a feature of both programs. It is clear, however, that PROSAR has much greater capacity to provide communities with regular water quality testing, an important tool for encouraging communities to chlorinate their water supply. AHJASA has established a chlorine bank program that supplies communities with chlorine at low cost. Although PROSAR also promotes the use of chlorine for water disinfection, communities can get free supplies from municipal health centers, which might be viewed as a continuation of state paternalism.

An important advantage of PROSAR is the relatively small number of communities assigned to each TSA and the integrated approach to providing backup support to rural communities. One of the positive qualities of PROSAR has been a flexible approach to working with private enterprises, as well as supporting local government with the CODEMs and municipal associations. These relationships and associations have ensured that there was some follow-up to the earlier PROPAR project.

The strength of AHJASA lies in community involvement in the management of activities and program development. The program has tried to reduce community dependence on external institutions and encourage self-confidence through sharing common experiences and solutions to water system problems. This approach would also seem likely to contribute to overall community development.

Both AHJASA and PROSAR depend heavily on external funding, without which they could not operate. Although PROSAR has a set term, a follow-up project is already in the making. If the SDC were to pull out, it is doubtful that the new project would become a reality. It is true that the MOH has implemented the PROSAR methodology in the PROPAR beneficiary communities, albeit on a much reduced scale. The same scenario applies to AHJASA, the only difference being that it has no fixed duration. If funding were not provided by IRWA or another source, its activities would be severely limited. It is quite possible, however, that the departmental associations would continue to survive, as they tend to view AHJASA as their own community development organization.

## Acronyms

AHJASA	<i>Asociación Hondureña de Juntas Administrativas de Agua y Saneamiento</i> (Honduran Water Board Association)
APP	<i>Agua para el Pueblo</i> , a Honduran NGO
APTOS	<i>Agua para Todos</i> (a private firm which provides water and sanitation backup support to communities in the department of Yoro)
CNSP	<i>National Commission of Public Services</i>
CODEM	<i>Comité de Desarrollo Municipal</i> (Municipal Development Committee)
FHIS	Honduran Social Investment Fund
IRWA	International Rural Water Association, a committee of NRWA
MOH	Ministry of Health
NRWA	U.S. National Rural Water Association
O&M	operations and maintenance
PROSAR	<i>Programa de Saneamiento Rural</i> (Rural Water and Sanitation Project)
PROPAR	<i>Proyecto de Pozos y Acueductos Rurales</i> (a rural water and sanitation project, 1986-1997, supported by MOH and SDC)
SANAA	National Water Supply and Sewerage Company
SDC	Swiss Agency for Development and Cooperation
SIAR	<i>Sistema de Información de Acueductos Rurales</i> (Rural Water Information System)
TSA	<i>Técnico de Salud Ambiental</i> (Environmental Health Technician)
TOM	Technical Operation and Maintenance project; Technician in Operation and Maintenance
WS&S	water supply and sanitation

# REGULATION OF WS&S SERVICES IN SMALL TOWNS

## A Review of Experience in Selected Countries in Latin America

Guillermo Yepes

### Abstract

Sector reforms initiated by most governments in the Latin America and Caribbean (LAC) region in the last 10 to 15 years focused on improving the provision of water and sanitation services and promoting decentralization and private sector participation (PSP) in financing and operating services. In the more developed countries in the region, reforms also included the creation of regulatory agencies to help deliver better and more efficient services and to protect consumers against potential abuse of monopoly power by public or private operators.

Regulatory initiatives often occurred simultaneously with efforts to decentralize water supply and sanitation (WS&S) services. These dual initiatives frequently were not complementary. Those who favored local governments' being in charge of operations were often opposed to a central regulatory system. In fact, regulation of medium-sized and small cities poses a special challenge to central regulation because of their size and wide disparities in human and financial resources. In practice, many small and medium-sized cities still regulate their services under an inadequate framework. On the other hand, economies of scale and scarce resources suggest that most local governments, and medium and small cities in particular, will need technical assistance and resources to effectively regulate services. Thus, the challenge is where to locate the regulator and the definition of functions as well as the development of a suitable mandate and policy framework within which effective regulation will take place.

This chapter provides an overview of the organizational trends in the region in the past 40 years. It describes the special characteristics of WS&S services that make them a classic monopoly and delineates the general principles of and options for regulation. The discussion, which is based on a review of the literature, looks at sector reform and regulatory initiatives in Guatemala, Honduras, El Salvador, Nicaragua, Panama, Dominican Republic, Paraguay, and Bolivia. In general, these countries have relatively small populations (less than 10 million) and numerous small and medium-sized cities, the largest of which has a fraction of the population of the capital. These countries are at an early stage of the sector reform process.

The chapter concludes with some preliminary observations and recommendations for framing a regulatory system, including the delegation of economic regulation to local governments and quality or social regulation to the central government. A key observation is that the responsibilities of the central government should include setting and vigorously enforcing realistic drinking water and wastewater discharge quality and service standards, promoting competition and benchmarking.



## 1. An Overview of Water and Sanitation Institutions in Latin America

By the early 1960s most Latin American countries had adopted a centralized organizational approach for providing water supply and sanitation (WS&S) services. This reflected the previous unsatisfactory delegation of responsibilities to the local level. Economies of scale and scarce talent were often cited as the driving forces behind the consolidation of services to the center. Chile in the 1980s opted for a delegated approach, with CORFO (*Corporación de Fomento*), a central government agency, as the holding company of regional utilities. Brazil also moved from local to state control of services in the early 1970s; that organization is still in place. Centralized systems had failed to deliver good and universal services<sup>19</sup>. Rates far below cost and lack of accountability led to low quality of services, limited access to services, operational inefficiency, and at times corruption.

By the early 1980s, many policymakers were ready to acknowledge that a centralized organizational scheme had failed to ensure universal access and efficient services. Large countries in particular began to abandon the centralized organizational model and once again, returned responsibilities to the local level. By the mid-1980s central agencies in charge of service provision had disappeared in many of the largest countries including Argentina, Mexico, Colombia, and Chile and, some years later, in Venezuela and Peru. In contrast, the small countries in Central America and the Caribbean (except Guatemala) as well as Uruguay and Paraguay in South America kept centralized organizations. But even in these countries as well as in Brazil, many local governments continued, de facto, to be in charge of services, a testimony to the less-than-resounding success of the centralized organizational model.

Subsidies were predicated on the need to keep prices low to make services “affordable” to all. As a result, investments and operations in the sector have been heavily subsidized in most Latin American countries. Cross-subsidized tariffs were also part of the paradigm of affordable services<sup>20</sup>. Cross-subsidy occurs when prices are kept below cost for some consumers (often, residential users) and above cost for others (often, industry and commercial customers), usually in response to concerns about social goals. While the intent is benign, in practice subsidies and cross-subsidies have not met, and might have even hindered, the goal of universal services. Low tariffs doomed public utilities to a precarious financial situation that constrained service provision and maintenance, and inevitably services for the poor were most seriously affected<sup>21</sup>. But the environment has suffered as well, as water pollution remained largely unabated, and in many urban areas, drinking water quality has not met government standards.

The shortcomings of the centralized system were not addressed before the devolution of responsibilities to local governments. In most cases the transfer was made in haste with local governments often unprepared to assume these new responsibilities. The authority to

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<sup>19</sup> Savedoff, William, D. and Pablo T. Spiller. *Spilled Water. Institutional Commitment in the Provision of Water Services*, IDB. Washington, D.C., 1999.

<sup>20</sup> Yepes, Guillermo. Do cross-subsidies help the poor benefit from water and wastewater services? Lessons from a case study. World Bank Infrastructure Note W-18. April 1998.

<sup>21</sup> Alfaro, Raquel, Vivianne Blanlot, R. Bradburg, and John Briscoe. *Reforming Former Public Monopolies: The Case of Water Supply*. Unpublished. World Bank, 1997.

set tariffs, in most cases, remained at the center so that financial policies remained unchanged, e.g., prices were kept below cost and non-transparent subsidies continued. Thus, decentralization was not able to attain the goal of improved and universal services; inadequate service under the central system was simply replicated at the local level, which further eroded support for government-operated WS&S institutions.

Policymakers, disenchanted with the results of publicly provided services, were also facing the need to fund large investments in the sector at a time of strained government resources. This led many to question whether the public sector could provide WS&S services adequately and to ask if new organizational and financing alternatives could be developed.

The particular problems of medium and small cities were also of concern to policymakers in some countries. Policymakers and public administrators are looking for ways to develop effective organizational options, such as promoting voluntary association of local governments and community participation, and more transparency in the way that public agencies conduct their business, as a means to increase accountability.

The increase of private sector participation in the region also has affected the issue of regulation. A major breakthrough occurred in the early 1990s when Argentine authorities invited private sector participation (PSP) in financing and operating services under a long-term concession contract for Buenos Aires. Rapid and substantial improvements in quality and coverage awakened interest in the region in the possibilities of PSP. Several countries (Argentina, Bolivia, and Chile) have made successful efforts to bring PSP to large cities; Colombia has involved the local private sector in the management of water and wastewater operations in medium and small cities. Such interest in private sector involvement has resulted in the need to provide adequate regulation of private operators.

The success of Chile's regulatory system in improving the quality of services increased regional interest in regulation. Participation of the private sector also made evident the need to safeguard consumers from potentially undesirable conduct and abuse of monopoly services. Policymakers were well aware that undesirable monopolistic behavior of public utilities had existed before, but regulation of public utilities was mostly ad hoc and intended to keep tariffs low. Moreover, regulation and service provision were often under the same institution, with obvious conflicts of interest. Monopolistic behavior by public agencies often translated into monetary and other benefits (rents) to some groups to the detriment of many, particularly the very poor, who had not benefited from services in the first place.

The reform dialogue in some LAC countries has been confusing at times for lack of clarity about central and local functions, enforcement, and financing instruments including the role of subsidies. Many local governments have a mandate to provide services but lack the authority to determine the financial resources needed to meet that obligation. One clear lesson from the Latin American experience is that lack of separation between the regulating and regulated entities made it extremely difficult for either to function effectively and contributed to the failure of the public service delivery model.

## 2. Regulation of Water and Sanitation Services

Water and sanitation services are often cited as the classic example of a monopoly service: large economies of scale, slow pace of technical innovation, and limited scope for competition. Moreover, these services are highly capital-intensive with long-lasting infrastructure as compared with other public services<sup>22</sup>. For instance, the ratio of total assets to annual revenues is about 10:1 to 13:1 for water services, about 3:1 to 7:1 for electric utilities, and 3:1 for telephone services. Water and sanitation services are also massively consumed, and they can have profound positive and negative effects on the health of the population, water resources, and the environment.

These characteristics render WS&S services difficult to provide through competitive markets and lead to potentially significant politicization of the sector's pricing and operations. Moreover, customers can seldom impose discipline on a utility that offers an inferior service by abandoning it for another provider that offers a better service<sup>3</sup>.

The goal of regulating monopolistic water and sanitation services should be to improve and maximize the well-being of the whole population. This can be achieved by sector reforms that foster accountability, transparency, and a level playing field for public and private service providers, and give them adequate incentives to reduce costs, increase efficiency, make services available to all, and protect the environment. To achieve these goals, governments have several options, which are not mutually exclusive.

- Continue provision of services through an autonomous public agency. Cooperatives (e.g., Bolivia), community-based water boards (e.g., Ecuador), municipal companies (Colombia), and voluntary associations of local governments (e.g., in the legislation in Colombia) are promising organizational options, particularly for small towns and peri-urban areas.
- Enact regulation and reforms that promote good services regardless of the legal nature (public or private) of the service provider. Under this approach, regulation attempts to provide a level playing field for public and private service providers and sets basic rules of conduct for both. This is the case, for instance, in Chile and Colombia.
- Accept some of the problems of a private monopoly as the lesser of two evils and do nothing about it. Concerns about these imperfections may be less important when weighed against current losses from poor services by a public monopoly.
- Transfer responsibility for services to the private sector and use government regulation to influence behavior (e.g., Argentina)

Experience from many countries suggests that there is a typical learning curve for regulation, and effective regulators capitalize on their successes as well as their mistakes to

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<sup>22</sup> World Bank. Meeting the Infrastructure Challenge in Latin America and the Caribbean. Directions in Development, 1995

improve services. Therefore, it is advisable to start regulation with a light approach and to avoid the temptation to solve all problems—some of which have been in the making for many years—within the timeframe of a political mandate. Heavy regulation, in the form of unrealistic social and economic goals and the attempt to regulate all aspects, has often discouraged compliance as it makes services more expensive and goals harder to reach and breeds public discontent for the regulator. A lighter approach also implies a balance between centralized and local regulation.

The following sections provide an overview of the different kinds of regulation.

### *Structure and Conduct Regulation*

The challenge for the water and sanitation sector becomes how to introduce effective regulation. To address this, governments must be concerned with the structure of the business and the conduct of its operators.

*Structural regulation.* Structural regulation seeks to isolate monopoly elements and prevent service providers entrusted with monopoly activities from extending their monopoly power. Therefore, it determines the degree of functional separation, i.e., the vertical and horizontal structure of a sector in which different firms can engage in. An example of vertical regulation is found in the power sector, where government dictates the functional separation of generation, transmission, and distribution systems to foster competition. A similar vertical separation in the sector is under consideration in several countries such as Colombia. An example of horizontal regulation in the water and sanitation sector is found when services are separated geographically, an approach that can foster competition by benchmarking.

Considerations of economies of scale suggest that concerns about vertical structure are not too relevant for small towns. However, considerations about horizontal regulation open the possibility of providing incentives for local governments to join forces in the provision of these services.

*Conduct regulation.* This aspect aims to define the desired behavior of organizations in their chosen activities and develop a set of incentives and penalties. Conduct regulation includes economic (price) and social regulation and specific policies directed against anticompetitive behavior. Economic or price regulation is predicated on the inherent monopoly characteristics of WS&S services. Social regulation, a catch-all category, is motivated by concerns about the performance of public or private operators as providers of a public service, equity considerations, and quality of services.

### *Economic Regulation*

Price regulation is the cornerstone of conduct regulation. Its purpose is to protect consumers from abuses by monopoly providers and private firms from abuses by governments, and to create an environment that gives incentives to public and private service providers to invest and operate efficiently. A major issue can arise as to how to establish incentives in a situation where the service provider's and society's interests

diverge. The situation is made more complicated as the regulator may not have access to full information. The main mechanisms of price regulation are:

- Rate-of-return regulation
- Price-cap regulation
- Regulation by commercial code.

*Rate-of-return (RoR).* RoR has been the traditional method of regulating investor-owned utilities in some countries. Under this regulation, utilities are allowed to earn an acceptable annual rate of return on eligible assets. A variant of the RoR is the “cost of service control,” which involves establishing a fair rate of return but as part of a wider evaluation of service costs.

RoR is based on capping profits rather than prices; there are few incentives for cost minimization, especially investment costs. Several studies of the drinking water supply in the United States, for example, have failed to find significant differences in the relative efficiency of private utilities subject to rate of return and unregulated public utilities. This seems to confirm the low-incentive characteristics of RoR regulation<sup>23</sup>.

*Price-cap regulation (PC).* Price-cap regulation was developed in the mid 1980s in the United Kingdom, in an attempt to avoid the problems associated with RoR regulation, particularly its tendency to put upward pressure on costs. PC regulation is also used in Chile, and most regulators in the region seem to be following this approach.

Under PC regulation, the regulator sets a maximum tariff (the price cap) so that an efficient firm will, on average, be able obtain the cost of capital (or rate of return) on the assets employed. The regulator determines the way the price cap can move over a fixed period (5 years in the UK) to allow the operator to reach sector development objectives. Over this period service rates are adjusted by a preannounced factor, endogenous to the regulated firm.

The experience of British regulators suggests that public acceptance of PC regulation depends on transparency and the willingness of companies to be ready to share benefits with their customers at an early stage.

*Regulation by commercial code (CC).* Commercial code regulation, also known as “light-handed” regulation, does not require a sector-specific regulatory framework. Firms operate freely without specific regulation; however, regulators monitor their performance on the basis of principles established by competition or antitrust **legislation in general.** For CC regulation to function it must provide a credible threat of regulatory intervention if firms engage in anticompetitive behavior, if prices rise too much, if quantity or quality become compromised, or if customers are not reasonably satisfied. CC regulation also requires well-functioning arbitration and judicial systems. For these reasons, it is more appropriate

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<sup>23</sup> Lambert, David K., Dimo Dichev, and Kambis Raffee. Ownership and sources of inefficiency in the provision of water services. Water Resources Research, Volume 29, June 1993.

for countries with developed legal systems, predictable regulation tradition, and political stability. New Zealand provides a good example of CC regulation.

Judgments about what constitutes a reasonable rate of return or adequate quantity or quality of water are better substantiated by comparing costs and performance of service providers (benchmarking competition). Making this benchmarking information widely available to the public, service providers, and local governments also adds transparency and credibility to the regulatory process.

### *Social Regulation*

Social regulation in the water and sanitation sector arises from concern that water production and consumption and discharge of wastewater can benefit or harm groups other than producers and users of services. Such effects, often referred to as “externalities,” are the justification for regulation of water quality, water resources, and the environment. Society is also concerned about services being available to all and about the need for consumers to have adequate information about the quality and costs of services.

*Drinking water quality.* Most consumers are not able to monitor water quality and are at the mercy of the operator. Therefore, governments have regulated water quality for drinking and other purposes. Many national governments in LAC and certainly all but a few local governments lack the knowledge and resources to establish drinking water standards and thus have adopted World Health Organization (WHO) drinking water quality guidelines or United States Environmental Protection Agency (USEPA) or European Union standards. These guidelines and standards include provisions to protect water supplies from contamination which, if properly enforced, can serve as the first line of defense to ensure safe drinking water. They also include mandatory requirements to inform the public of water quality problems or upcoming service interruptions. Governments set standards for design and construction materials for water and sanitation works, chemicals to be used in treatment processes, and indoor plumbing systems to protect water quality.

Regulation of drinking water quality, particularly for small towns, often fails to take into account their capacity to operate water supply systems to the same standards that large cities must meet. As a result, these standards are often not met, creating an undesirable precedent that can hinder future progress in achieving water quality goals. To break this cycle of noncompliance, emphasis should be placed initially on providing water that is safe (in terms of bacteriological and toxic substances) and on building the capacity of local governments to deliver higher quality services in the future.

*The environment and water resources.* Protection of the environment is not only valid but is also a growing social concern worldwide. This has led to the regulation of the point and quality of wastewater discharges and treatment byproducts into receiving bodies of water or on land. The adequate use of water resources is another growing societal concern, particularly in countries or areas where water resources are becoming scarce. Optimum use of ground and surface waters, volume and location of water extractions, and satisfying competing demands by other water users including water needs of ecosystems are all issues

for the water resource regulator to consider. However, water resources and environmental regulation are often entrusted to separate central agencies (e.g., Mexico).

Most countries in the region and elsewhere tend to rely on administrative or “command and control” regulation for drinking water quality, water resources, and environmental management rather than on regulation by incentives (carrots and sticks). An example of command and control regulation is the requirement that municipal wastewater should receive secondary treatment to meet certain water discharge quality standards. In contrast, incentive regulation leaves the selection of treatment process to the service provider and relies instead on imposing water pollution and discharge fees to reach water quality goals. While in practice, both approaches are needed, the trend seems to be in favor of introducing incentives to promote desired outcomes and changes in behavior. Recent water pollution control legislation in Colombia, for instance, relies heavily on incentives.

### *Contract and Discretionary Regulation*

There are basically two strategies for economic and social regulation: contract or discretionary regulation, and both can and have been applied to influence the conduct of public and private operators.

In *contract regulation*, all obligations and rights of the operator, the government, and customers are incorporated in detail in the concession contract between the private operator and the government agency making the award.

Contract regulation with private operators is the form most often used in Latin America as well in other countries with no previous or limited regulatory experience dealing with private provision of water and sewerage services. Private investors are more comfortable with this form of regulation because of its clarity in less predictable political environments.

Some governments in LAC and elsewhere have extended contract regulation to public operators in the form of revocable operating licenses, letters of understanding, or action plans detailing service improvement objectives over a certain period. In the latter, the government often provides financing and other resources in exchange for the public operator’s achieving certain development goals. These agreements have been used in an attempt to improve the accountability of both parties, but in practice they have fallen short of expectations.

*Discretionary regulation*, on the other hand, rests on a framework of policies that cover the rights of providers and consumers. Under this approach, the regulator is given substantial discretion to set prices and service standards for the regulated service provider. While the authorizing statute constrains the regulator to some degree by specifying the factors that it must consider, the regulator enjoys substantial freedom in interpreting them (e.g., Colombia, Ecuador, Bolivia). The principal disadvantage of discretionary regulation is that it may be politically and technically difficult for the regulator to strike a reasonable balance between consumer and producer interests when setting price and service standards.

It is impossible to foresee all events that could affect a long-term contract with a public or private operator/investor and to specify the appropriate response to each event. In practice, therefore, elements of discretionary regulation are always present.

### *Multiple Regulators*

The structure of regulation in most countries in Latin America and elsewhere is quite complex, as provision of WS&S services impinge on so many facets of community life. Moreover, how a community handles its WS&S services has the potential to adversely affect other communities or users. The many aspects of regulation of water and sanitation activities can thus involve several other regulatory agencies, each with specific roles, not always mutually consistent.

In Colombia, for example, economic regulation and social regulation are entrusted to two separate central agencies, one in charge of economic activity (*Comisión de Regulación de Agua Potable*) and the other of social regulation (*Superintendencia de Servicios Públicos*). In contrast, in Bolivia, Peru, and most Central American countries, the same functions are performed by a single central agency. In Argentina, specific regulatory agencies have been created to oversee private concessions, but formal regulation of public providers is still absent. Still other countries, such as Mexico and Ecuador have a split system: water resources and water quality are regulated at the central level while economic regulation is at the state or local level. In most countries in LAC, drinking water quality is the responsibility of the Ministry of Health, but regulation of quantity and quality of water resources rest with a separate agency. The Ministry of Environment sets wastewater discharge standards and other aspects with direct links to the environment.

The existence of several regulatory agencies with specific roles has a number of advantages: it insures open debate over the desirable allocation of water resources between competing uses and users; it also provides checks and balances which reduce the risk of one particular interest group dominating the industry; and it lessens the possibility of regulatory capture.

It would be naïve, however, to assume that the number of agencies involved does not entail problems. Regulation can become oppressive, with each agency seeking to impose different, and possibly incompatible or contradictory, requirements on the industry. This is the case, for instance, when the environmental regulator imposes drinking water or wastewater discharge standards that are out of line with the capacity of the population to pay and hence with price regulation. The existence of several regulators also makes it easier for the industry to play the regulation game by attempting to pit one regulator against the others<sup>24</sup>

The critical point here is for the regulator to exercise restraint in imposing quality and service standards that are higher than the population can afford.

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<sup>24</sup> Rees, Judith. Regulation of Water and Wastewater Systems in the United Kingdom. World Bank seminar, 1994



### *Where to Locate the Regulator*

An ongoing debate in many countries in Latin America is at what level of government the regulator should be located and which responsibilities should be assigned to each level. This debate is driven by concerns about and prospects for effective regulation.

One group of policymakers favors regulating at the center, with consolidation of regulatory functions. This viewpoint is based on the complexity of regulation and the lack of expertise and resources at the local level to carry these functions effectively. Similarly, the argument that social regulation should reflect national objectives leads to the conclusion that a central agency would be better suited to help achieve them. One potential undesirable effect of central economic regulation is the political pressure from local governments for higher subsidies in lieu of high rates, pressure that many governments find difficult to resist (e.g. Peru, Costa Rica) as they can be easily perceived by the public as responsible for tariff increases. Decisions from the central regulator not to authorize proposed tariff increases also remove some of the responsibility of local operators to meet development goals.

Policymakers in favor of a decentralized public regulation system would place responsibility for social regulation at the center, while economic regulation would rest with local governments. However, local government can also have legitimate development objectives, going beyond those set by the central government. In such cases, local governments would be allowed to set additional goals and the economic or financial instruments to meet them. (To some extent, this is the model that prevails in the United States, where state and local governments can set more stringent standards than the Federal Government, and local governments are responsible for allocating financial resources and setting service rates to meet them.). For this option to work, it is wise to develop an adequate national framework and guidelines for local regulators to help them discharge their regulatory and service responsibilities in a cost-effective manner and to have a well-staffed central technical office that can help local governments in this endeavor, particularly small ones, in developing tariff guidelines that promote efficiency, good water demand management, and adequate protection of the environment.

In most large Latin American countries, a highly centralized regulatory system has not been able to deal effectively with price and quality regulation in the medium-to-small cities, given the sheer number of them (e.g., Colombia)<sup>25</sup>. In addition, some regulatory agencies have been less than effective in dealing with utilities in large cities as these often have more political clout. In practice, many local governments have to fend for themselves, albeit not very effectively, partly because of inadequate regulatory legislation but also due to wide differences in resources available to them.

A one-to-one regulator-service provider relationship can create special problems as observed in small countries where one service provider dominates the market (e.g., Costa Rica) or in large concessions where a regulator has been created to oversee a specific contract (e.g., Buenos Aires). The limitations of this arrangement are accentuated by the

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<sup>25</sup> Spiller, Pablo T. Plan de Acción y Estrategia Regulatoria. Comisión de Regulación de AguamPotable y Saneamiento Básico - Colombia. Informe Final. Mayo 19, 2000.

lack of transparency and an adequate benchmarking system and increases the risk of regulatory capture.

Regulatory regimes, once established, tend to resist change as government agencies are afraid of losing credibility by changing the rules in favor of certain groups. It is difficult to design a perfect regulatory system, and regulatory bodies have a natural tendency to avoid flexibility. For these reasons, it is best to design systems that are not too elaborate and complex. In the initial stages it is particularly important to avoid the temptation to second-guess operational decisions of service providers as they lead to interference. Interventions by the regulators should be determined by outcomes rather than inputs. A recent review<sup>7</sup> of the economic regulatory experience in Colombia recommended simplification of the system to make it more operational, given the resources available at the central and local levels. The lighter the regulatory touch and the more transparent the system, the easier it will be to change when necessary. This implies a regulatory environment where the central agency does not try to regulate everything and instead establishes guidelines within which local regulation can take place. Core regulatory function such as tariff approval and monitoring of service provision can be delegated to local governments.

### *Public Participation*

Consumers are often the best monitors of service quality; consequently, consumer feedback can motivate suppliers to provide high-quality services, and their input can be critical to efficient service. However, be they individuals, business, or industry, consumers are seldom involved in the regulatory process. Consumer participation in the regulatory process also adds transparency to the decisions of the regulator. In the United Kingdom, for instance, there is a consumer commission in each of the 10 water service jurisdictions, each headed by a commissioner who reports to the regulator (OFWAT) about the needs and the concerns of the consumers.

Organizing effective consumer involvement in the regulatory process is likely to take time and effort in most countries in the LAC region, as there is little experience with such participation. Nonetheless, governments should strive to provide an adequate legal, institutional, and policy framework to promote participation.

### *The Cost of Regulation*

Regulation imposes direct and indirect costs on the regulated firms as well as on the economy both in terms of money and possible misallocation of resources.

The direct cost of administering the regulatory process includes the budget of the regulatory agency and the cost borne by the regulated industry. The direct cost is often the smaller of the two. For example, in Buenos Aires there is a 2.7% tax, collected by the operator, on all water bills to fund the regulator (ETTOS). In Chile, the 1993 budget of the regulator (*Superintendencia de Servicios Sanitarios- SSS*), financed by the central government budget, was about 0.6% of the water industry billing. Some argue that although effective

regulation has a cost, in the long run it provides savings to consumers by promoting efficiency and keeping a watchful eye on tariffs.

Local governments have similar options to finance the costs of their regulatory effort. The financing option should minimize the burden and costs on the operator and the local government. Moreover, it is important to avoid built-in mechanisms that encourage regulatory growth, as they are likely to create a bloated bureaucracy and thus regulatory inefficiency and rigidity in the long run<sup>3</sup>.

The regulated industry and not the regulators tend to bear the main costs of administrative regulation. The operator must invest in planning units whose function is to monitor the conduct of the regulators, to attempt to predict future regulatory decisions and changes in regulatory policy, to prepare documentation for regulatory reviews, and to support the utility's claims at the time of regulatory reviews. Misallocation of resources can occur when the regulator directs the service provider to undertake actions, including investments, where the costs far exceed the benefits. It is important to keep in mind that eventually users pay these costs.

### *Independence of the Regulator*

Regulators should have sufficient independence from the legislative and executive branches of government to allow them to make final decisions, subject to a normal appellate process, and to be free from short-term or partisan political considerations. The issue is not so much that the regulator should be entirely free of politics (which is not the case in any country), but rather that the process should be as de-politicized as possible, while holding the regulators accountable<sup>26</sup>.

Practical ways to put some distance between the regulator and politics are appointment of high-level regulator officials for terms exceeding those of elected officials and limiting the conditions for their removal (e.g., reasons other than incompetence or illegal conduct). Such terms contribute to the autonomy of the regulator.

Regulatory agencies, like all institutions, interact with other institutions and interests, including the businesses they regulate. In this milieu, the regulator is often eager to respond favorably to the needs of a particular group, e.g., the government, the regulated utility or its workers, the consumer or special interest groups, a process often referred to as "regulatory capture." Establishing an open and transparent regulatory system is perhaps the best way to avoid this problem. Given the long history in the LAC region of state interference at all levels in the provision of water and sanitation services, establishing a non-political regulatory system can be a formidable challenge to the legislator.

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<sup>26</sup> Infrastructure in a Market Economy Seminar. Harvard University. July 1999. Class Notes.

### *Competition*

*Framework for competition.* The WS&S industry is the most often quoted example of a natural monopoly. However, the success of competition in the telecommunications, gas, and electricity sectors, which were once considered natural monopolies, suggests that competition might also benefit the water sector. While it is unlikely that competition in the sector will obviate the need for regulation, pro-competition reforms should be considered alongside familiar models of public and private service providers and regulation<sup>27</sup>. Two basic forms of competition are possible: competition for the market and competition in the market.

Competition for the market entails awarding PSP contracts always through an open and transparent bidding process. This form is important but limited, as frequent rebidding is seldom cost effective. Exclusion of the incumbent from future bidding may not be cost effective, so it could be difficult but not impossible to attract new bidders if the incumbent is allowed to participate in the bidding process.

Competition in the market, while limited in scope in the water and sanitation sector, opens the possibility of firms competing in the production, treatment, and distribution of

water and in the collection and treatment of wastewater. Perhaps the most promising areas of competition in the market are in the treatment of water and wastewater. However, as the experience in Paraguay clearly shows, competition in the distribution of piped drinking water is also possible.

Benchmarking competition. All regulators face the shortcomings of information, as the operator is always in a better position to know more about its business. Therefore, adequate information is of the utmost importance for effective regulation. Benchmarking competition attempts to redress the information imbalance by comparing investment and operating costs, and input/output levels of different utilities (public and private) operating under rules that ensure a level playing field.

Benchmarking competition relies on the collection, comparison, and dissemination of information, under uniform and consistent reporting requirements, of operations and investments of service providers. Examples of operational parameters include staff per connection or revenue ratios, water losses, hours of service, financial ratios, and maintenance indicators (e.g., pipe breaks per unit length of distribution system). Investment information is often reported as costs per unit of capacity installed. Benchmarking competition is more than just comparing operational or investment results as many indicators are sensitive to economies of scale and geographical conditions that need to be properly understood to draw meaningful comparisons. This information provides the regulator and the public with valuable information to judge the performance of service provided and the reasonableness of the cost of providing them. OFWAT in the U.K. has been at the forefront of using benchmarking, both within and outside the industry, to assess utility performance. The concept of the “model utility” in Chilean regulation also uses

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<sup>27</sup> London Economics. Competition in Water, April 1998.

benchmarking to determine its costs and to assess the rates that each utility can charge. The regulator in Peru has begun to introduce benchmarking competition and dissemination of information with promising results.

Benchmarking competition is particularly important if local governments are entrusted with economic regulation. However, it would be prohibitively expensive for each local government to collect information about operations and investments from other cities and to draw meaningful comparisons. Nonetheless, a central government agency need not be in charge of collecting and disseminating information for benchmarking to work. Professional associations, such as AWWA in the United States, have performed this function in a non-confrontational environment, and similar organizations in Argentina (AIDIS) and Ecuador are considering following AWWA's steps. Associations of local governments, such as AME in Ecuador, also have the potential to perform these services.

There is a danger when introducing benchmarking of the regulator's imposing too many indicators and too frequent reporting requirements on the operator in an attempt to know all about the sector and each operator. In such cases, the regulator may lack the resources to process the information effectively and to insure that the information is reliable (e.g., Mexico). The operator, in turn, may find many of these indicators useless and thus be unwilling to collect and report them. An early attempt in Peru to set up benchmarking failed, in part, for these reasons.

### **3. Regulation Experience in Selected Countries.**

In the sample of small countries described in this section, regulation was either weak or nonexistent until recently. National public operators generally were unregulated (El Salvador and the Dominican Republic). It was not uncommon to entrust operational and regulatory functions to the same agency (Costa Rica, Panama, and Ecuador). In practice, municipal operators in most of these countries are self-regulated; they are not required to meet formal sector goals, constrained by a hard budget imposed from the outside, or obligated to respond to a regulator who is vigilant about compliance.

Most central and local governments seem eager to escape the familiar trap of bad services and low cost recovery; they want to improve services and coverage. Yet, political will to adopt profound sector reforms, including establishing a sound legal and regulatory framework, to escape from this trap is still weak in most of these countries. Moreover, sector reform and regulatory initiatives in several countries (e.g., Panama, Ecuador) stalled after a good start. The public (in Panama) and local governments (in Ecuador) were not adequately informed about the rationale and goals of these initiatives and, not surprisingly, did not support them or even opposed them. As a result, efforts to reform the sector and establish an effective regulatory framework have proved difficult.

Municipalization and decentralization reforms have been intertwined in the water and sanitation reform dialogue in many of these countries. This has further complicated the question of regulation since in many countries, municipalities see central government

regulation as an infringement on their rights, especially in light of the poor track record of central government in providing services.

*Dominican Republic.* Regulatory reform is under consideration in this country. Strategies have been proposed for reorganizing service provision based on the corporatization of services in main urban centers. To this end, INAPA, the national agency, has been regionalized and progressively broken down into regional state companies. In addition, small-scale urban and rural systems have been returned to community control. The rapid expansion of resort areas also has prompted the government to consider providing WS&S services in those locations through concessions to private operators.

In this context, the main functions of the national regulator would be to set maximum tariffs under efficiency criteria, protect consumer's service rights, and provide contract supervision with private operators. Two consultative groups would be attached to the regulator representing the users, private developers, and voluntary organizations active in the sector. There is concern that these consultative groups might "capture" the regulator. Environmental regulation still is not clearly defined. As to water quality, no effective mechanism has been established to monitor, supervise, control, and enforce standards.

*El Salvador.* The central government has drafted a regulatory law for the WS&S sector. The draft law would establish a central regulatory body to oversee the sector, determine the rules of the game, and grant all concessions. The new regulatory agency would be responsible for conduct, economic, and social regulation. Municipalities would have little or no role in determining how services are provided. Concessions could be requested from both public and private entities using a range of management models including municipal companies, water boards, or management contracts, but the municipality would have no voice in the granting of the concession. This law will be debated in the legislative assembly in 2001. Currently ANDA, the national water authority, controls tariffs for municipal systems that it operates, but would no longer do so under a decentralized system. The regulatory situation will not be further clarified until the law is drafted and approved.

*Guatemala.* The organization of Guatemala's WS&S sector is unique in Central America, as no single national office is responsible for oversight of sector development, and service delivery thus is effectively decentralized<sup>10</sup>. Local government is the central actor responsible for service provision, planning, and regulation of urban services. In practice, local governments do not effectively regulate services. Low service levels and low quality of services call this model into question. In addition, in the sector transformation, the central government has not provided the necessary leadership to improve sector performance.

*Honduras.* Currently there is no formal regulation at the local level in Honduras, although a national commission (CNSP – *Comisión Nacional de Servicios Públicos*) oversees SANAA's tariff. SANAA operates less than half of the municipal water and sanitation systems in the country. The 14-member deliberative council of CNSP is made up of members representing diverse social and interest groups with frequently conflicting

interests. In theory, CNSP deals with all public services that do not have their own regulator, but it lacks the resources to perform its duties effectively<sup>1</sup>.

Previous efforts to reform the sector stalled. However, the law governing the water and sanitation sector is currently being revised and is expected to be approved by Congress in 2001. Although the main structures in the sector will remain, the responsibilities will be reorganized and better defined. The Ministry of Health will remain the lead agency and will formulate national policy, develop objectives and strategies, and establish regulations and standards. A proposed new regulatory commission that will operate under the auspices of the MOH will have legal authority to enforce regulations and standards in rural and urban areas. It will also oversee the granting of concessions. SANAA will no longer be a service provider, as all systems will be transferred to municipalities, but it will still be responsible for the development of rural WS&S systems. The municipalities can choose to operate the system directly or through a municipal company or award a concession to a private or public organization.

The reform process initiated in 1995-1996 proposed the creation of a national regulator's office. The reform stalled in part because local governments, which were to assume control of the system operation under the same law, contested the proposed central regulator. Local governments argued, not without reason, that establishing a national regulator was inconsistent with municipal autonomy. A similar reform process in Ecuador met the same fate. If the new law is passed in Honduras, the acceptance of the regulator by municipalities may still be an issue that will need to be addressed.

*Nicaragua.* The actions of the Chamorro (1990-1996) and Alemán (1996 to present) administrations set the pace for the rapid modernization of the water supply and sanitation sector<sup>28</sup>. The reform seems to be on the right path; the reform law passed in 1998 designated the newly-created ENACAL as the holding company of eight regional companies, with the intent of later privatization of these companies. Under the same reforms, sector planning was assigned to the Ministry of Construction and Transport and transformed INAA, the former national operator, into the regulator. However, because the capacity of the Ministry of Construction and Transport to carry out sector planning is low, the National Commission for Water Supply and Sanitation was formed to act as temporary coordinator and possibly become a permanent agency for the future. INAA is the entity with primary responsibility for structure, economic, and social regulation. Specifically, INAA regulates service quality, concessions tariffs, norms and standards, compliance with environmental regulations (with the Ministry of Natural Resources and Environment), and compliance with water quality norms (with the Ministry of Health). It also imposes sanctions and mediates conflicts.

This reform model and path is similar to the successful one followed by Chile in the 1980s. It represents an extraordinary achievement in Central America, where discontinuity in government policies normally occurs when a new administration comes to power.

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<sup>28</sup> Walker, Ian, and Max Velasquez. Regional Analysis of Water Supply and Sanitation in Central America and the Dominican Republic. EHP Activity Report No. 65. May 1999.

*Bolivia.* In the late 1990s, Bolivian authorities embarked on an ambitious sector reform that began with the creation of a multi-regulatory agency (SIRESE -*Sistema de Regulación Sectorial*) and five sector-specific regulators (*Superintendencias* for Electricity, Hydrocarbons, Telecommunications, Transport, and Water). The reformed sector system apparently was performing well until recently, as measured by the positive results of the concession in La Paz. However, earlier in the Banzer administration, the regulator was stripped of some of its authority. Most recently, the Cochabamba water and sanitation concession, granted through direct negotiations with a private operator, was revoked less than a year after the concession contract was signed, allegedly because of violent customer complaints about a tariff increase approved by the regulator. It is likely that the water price increase approved “was simply the spark that ignited a host of smoldering internal tensions”<sup>29</sup>. It is too early to assess the effects of these government decisions, but they may discourage future private investment.

*Paraguay.* Paraguay passed a regulatory law in November 2000 that creates a central body (ERSSAN) to oversee the provision of services and conduct, economic, and social regulation. Under the new law, services will be provided through concessions or permits granted by ERSSAN. Currently services are provided by the National Water Company, CORPOSANA, to communities over 4,000 and by the National Environmental Health Service, SENASA, to communities under 4,000. In practice CORPOSANA provides services to only 19 of the 57 municipalities under its jurisdiction. The role of SENASA and CORPOSANA will change under the new law. SENASA will no longer have a regulatory or supervisory role, but will continue to implement projects in communities under 10,000. The future of CORPOSANA is not yet determined. The new law will provide the following:

- Establishment of a regulatory body (ERSSAN) that will provide overall regulation and establish agreements between the national government and local governments
- Greater involvement of the private sector in service provision and building infrastructure
- Authority to grant all concessions and permits rests with ERSSAN
- Provision for some participation of municipal and department governments by giving them representation on the regulatory committee.

In the proposed law, all forms of regulation—structure and conduct, economic, and social—would reside in a single body at the national level. 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 sole authority to grant concessions. Under the new law, subnational governments may have a role in the provision of WS&S services depending on their capacity and the willingness of the Executive to transfer this right to them. If ERSSAN awards concessions to private companies as the primary way to provide services, then the role of ERSSAN as a regulator of private companies will become critical. The 400 small, local private operators (*aguateros*) that provide services to about 20% and 16% of the urban and rural population,

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<sup>29</sup> Global Water Report. Bolivia: The Cochabamba Crisis. April 14, 2000



respectively, will also be regulated by ERSSAN and will be granted permits for 10 years, after which the infrastructure will revert to government ownership.

#### 4. Conclusions

This overview of regulation in Latin America has highlighted several central questions facing countries as they approach regulatory reform:

- What are the core regulatory functions?
- At what level of government should the regulators be located?
- What are the core functions of a central regulatory agency?
- What is the effect of multiple regulators?
- What is the cost of regulation?
- How can an effective regulatory environment be established.

Although definitive answers to these questions do not exist, the examples reviewed provide guidance on what the important issues are. In the sample of countries surveyed, some key lessons have emerged:

- Political support as well as consultation with local governments is essential to enact reforms that are widely accepted and establish a regulatory framework providing a minimum level of oversight. For example political support for the reform in Nicaragua is one of the primary reasons for its success.
- Public campaigns are also important to educate the populace about the merits of the proposed reforms, including decentralization, private sector participation, and regulation, and who stands to win and lose from such reforms. After many years of bad service and broken promises, the public is understandably skeptical. Some countries (e.g., El Salvador) have been reluctant to fully engage the public in the reform debate.
- Decentralization and central regulatory objectives must be compatible to preserve devolution of power to local governments and enhance accountability. Hence, the issue of where to place the regulator remains open. In Paraguay, for example, the professed goals of decentralization are largely incompatible with the sweeping powers of the proposed central regulatory body. In Honduras, the resistance by the municipalities to the establishment of a national regulatory framework because of their desire to protect their autonomy resulted in a stalemate for several years, which now seems to be resolved.
- To make economic regulation work effectively, local governments, particularly medium and small ones, will require technical support, including collection and dissemination of benchmarking information about costs and quality of services. One of the weaknesses of the decentralization of services in Colombia in 1987 was the failure to provide this type of technical support.

- Countries without a history of regulation should start out slowly and not try to regulate all aspects immediately. Getting accustomed to being regulated, developing enforcement mechanisms, and learning how to regulate all take time and experience.
- All regulation does not need to occur at the national level. In the foreseeable future, it is not realistic or even desirable for a central agency to be responsible for all regulation. The capacity to monitor and enforce regulation does not exist at present. Local regulation should be considered an integral aspect of a national system. At a minimum the national government should set water quality norms, technical norms and standards, and environmental standards and prevent monopolistic behavior by private sector providers.

Regulatory experience in nearly all countries in the sample is in its early stages, but is likely to develop rapidly as successful (and even less successful) lessons become known throughout the region. Much more remains to be done, particularly in the following areas:

- Adequate regulation of public enterprises continues to be a challenge. Overall regulatory experience in Latin America is less than satisfactory with the notable exception of Chile. Quality of services provided by public enterprises, at all levels, has not improved noticeably after formal regulation was introduced. The emphasis has been on keeping rates down, though they were never high in the first place, at the expense of social regulation (quality of services).
- The regulator must have adequate independence from political pressure. Most regulatory agencies would benefit from greater independence to build a consistent and predictable set of rules applicable to all regulated utilities, including developing a level playing field for public and public utilities.

## Acronyms

CC	commercial code
CNSP	<i>Comisión Nacional de Servicios Públicos</i> (National Commission of Public Services), Honduras
CORFO	<i>Corporación de Fomento</i> , Chile
CORPOSANA	<i>Corporación de Obras Sanitarias</i> (National Water Supply and Sanitation Company, Paraguay)
ENACAL	<i>Empresa Nicaragüense de Acueductos y Alcantarillados</i> (National Water Supply and Sanitation Company, Nicaragua )
ERSSAN	<i>Ente Regulador de Servicios Sanitarios</i> (newly established regulatory body for WS&S services; responsible to the Executive Branch, Paraguay)
PC	price cap
PSP	private sector participation
RoR	rate of return
SANAA	<i>Servicio Autónomo Nacional de Acueductos y Alcantarillados</i> (National Water Supply and Sewerage Company, Honduras)
SIRESE	<i>Sistema de Regulación Sectorial</i> , a multi-regulatory agency in Brazil
WHO	World Health Organization
WS&S	water supply and sanitation

## CONCLUSIONS

Fred Rosensweig

The case studies presented in this document discussed three distinct themes—the role of small municipalities in the provision of water and sanitation services, institutional arrangements for backup support to rural communities, and regulation of services. The case studies reflect experience in five countries: the small municipality examples come from Paraguay, El Salvador, and Colombia; examples of institutional arrangements for backup services are drawn from Honduras and Nicaragua. The chapter on regulation takes a regional perspective.

These case studies provide a rich source of information for some of the most difficult challenges facing the WS&S sector—improving services in rural communities and small municipalities. Each case study looks at strengths and weaknesses of an approach and examines why the particular design has been successful and what is required for sustaining success and for further replication. This chapter steps back and looks across all the case studies to draw some overall conclusions. Keeping to the focus of the case studies, the conclusions are drawn on the policy, institutional arrangements, and management issues described in the case studies rather than the more specific operational or technical details.

The conclusions are presented in five sections:

- Overall observations
- Management models for small municipalities
- Institutional arrangements to provide backup support to rural communities
- Regulation of services in small municipalities
- Summary.

### Overall Observations

The case studies are a testament to lessons learned in the past 20 years in the water and sanitation (WS&S) sector about the central elements of sustainable projects. Although these lessons will not be discussed in detail here, they include certain key elements:

- The importance of cost recovery
- The need for meaningful community involvement
- The impact of the selection of technology on sustainability
- The need to focus on operations and maintenance
- The key role of institutions.

The case studies described in the preceding chapters reinforce the validity of the current conventional wisdom—the elements above are crucial for sustainability.

In general, the following additional observations can be drawn from the case studies:

- *Autonomy.* The importance of autonomy over all operational matters is seen in each case study. Autonomy includes the independence to make decisions about priorities, staffing, planning and implementation of activities, and budgets. In the rural case studies, the regional entities that provide backup support in both countries have substantial autonomy over operational matters even though they are part of a national structure. In the municipal case studies, the local utilities all have almost total operational autonomy, although Marinilla is subject to tariff approval by a national agency of the Colombian government.
- *Role of legal and regulatory reform for replication.* In the municipal cases, the broad legal and regulatory context is fundamental to scale-up. In Colombia, the legal environment permits private sector involvement and, as a result, the model could be replicated elsewhere in the country. In El Salvador and Paraguay, on the other hand, scale-up of the models is dependent on a change in the legal and regulatory framework. In El Salvador, decentralization of responsibility for WS&S to municipalities would have to become the formal policy of the government. Although this is being discussed, it is not yet the stated policy. In Paraguay, the water board model is intended for communities of less than 4,000 and theoretically could not be used by small municipalities that exceed 4,000 unless the law is changed.

In the rural examples, the legal and regulatory environment does not seem to be as critical for scale-up. In Honduras, the TOM program developed to a national level despite the absence of legal and regulatory reform. In Nicaragua, in reality the reform focused mostly on the urban sector and much less on the rural areas. Despite this, the municipal promoter program has been developed, and there does not appear to be any legal or regulatory impediment preventing its replication.

- *Role of external donor assistance in technical assistance and financing.* In every case, with the exception of Marinilla, donor assistance was needed to provide technical assistance and finance capital investment. Even in Marinilla, funds from the central government were needed for capital improvement. Outside assistance in the early stages is especially important when a new model is being implemented. One of the reasons that service provision in San Julián has been successful is that the municipality received limited but important technical assistance in the early stages and a grant from the Social Investment Fund to rehabilitate its water supply system. If the San Julián experience were to be replicated on a large scale, say in 50 or 75 municipalities, some kind of technical assistance program would have to be organized, probably with donor assistance.
- *Compatibility of decentralization and regulatory objectives.* If municipal decentralization is the stated policy of the government, then the regulatory framework must reflect that intent. A case in point is Paraguay; overall municipal decentralization is the national policy, but the new WS&S law puts most of the power in the hands of a central regulatory body, with little voice for the municipalities beyond a promised seat at the table. Similarly it is difficult to imagine sector reform based on municipalities'

having responsibility for WS&S services without a broader national commitment to municipal decentralization in general. In Nicaragua, legal and regulatory reforms were completely consistent with broader decentralization objectives. A government that is serious about devolving responsibility for WS&S services to municipalities must also reduce central control over tariffs and other operational matters that tie the hands of local government.

- *Sanitation not given equal weight.* Sanitation clearly lags behind water supply. It is unclear if the prevailing model used in water management, as described in the case studies, can deal with sanitation issues. Would they be as effective in dealing with wastewater collection and treatment? In the rural models, the focus is clearly on the management of water supply services. While the importance of sanitation is acknowledged, it does not receive the same attention or investment.

## Management Models for Small Municipalities

- *Enlightened local leadership.* The importance of enlightened local leadership cannot be overstated. In all three municipal cases, the mayor and other local officials provided the leadership needed to gain popular support. Such leadership is especially important given the tempting revenues that a successful water utility can generate!
- *Burden of sanitation.* Adding a functioning wastewater collection and treatment system would make the service provision task much more complicated. Of the case studies discussed, only in Marinilla is wastewater collected; it is important to note, however, that Marinilla is a more developed city and has greater access to resources than either Itagua or San Julián. This situation does not minimize the accomplishments of Itagua and San Julián; wastewater services are more costly to provide and more complex to maintain than water provision. It is not clear how well those two municipalities would have fared had wastewater collection service been part of their mandate.
- *Access to external capital financing from the start.* Access to external funding for capital financing is virtually a prerequisite to success. All three cases benefited from external financing, either through a loan or grant. It is highly unlikely that a small municipality could provide the initial financing to improve its water supply system or that customers would be willing to pay for services.
- *Cost recovery.* All three cases clearly demonstrate that full recovery of recurrent costs, including depreciation, is possible in small towns after the initial capital investment. All systems now cover full operating costs and depreciation; they also generate excess revenues for limited capital investment. Both Itagua and Marinilla also pay debt service on loans. San Julián received a grant to rehabilitate its system, so it does not have any debt to service.
- *Accountability and transparency.* All three cases point to the importance of accountability, especially through meaningful local involvement. In Itagua a general

assembly meets annually to review operations, assess the performance of the board, and elect new board members. In Marinilla, the elected municipal council approves all major decisions and in San Julián, the board of directors of the company is popularly elected by a general assembly of water users. In all the cases, there is in effect a system of accountability to users that serves as an incentive to maintain and improve services.

- *Role of the private sector.* In two of the cases—San Julián and Itagua—the private sector has no role in the management of services. This is not to say that the private sector cannot play a role in managing services in small towns, but it illustrates the point that private sector management is not required. To date, except for the more developed countries in the region, there is little evidence of private sector involvement in management of services in small towns. Marinilla is a good example of what is possible, but it is, even by Colombian standards, a reasonably well off municipality. The key lesson is that a range of management models is possible, depending on the context.
- *Scale-up.* Unlike the rural cases, scale-up of these municipal models is very much linked to sector reform and support for decentralization. All three examples provide testimony to what can be achieved if local governments are given responsibility for WS&S services. Yet the question remains whether these three are isolated examples, with little chance of being replicated elsewhere. In both Paraguay and El Salvador, scale-up is dependent on the nature of the sector reform including the regulatory structure that is established. No model will be widely replicated without the right enabling environment. That supportive base will include letting the municipalities make decisions regarding how services will be provided—whether they want to establish a municipal company, a water board, or a management contract with a private sector firm—and giving them the necessary technical assistance in the early stages and access to capital financing.

## Institutional Arrangements to Provide Backup Support to Rural Communities

- *Cost of programmatic infrastructure.* In all of the rural cases, the programmatic infrastructure for backup services was funded by external donors. Given the general lack of resources in many countries and the inability of most rural communities to pay for backup support, the cost of establishing programmatic infrastructure, such as training of promoters, logistics support, maintenance of an information system, etc., is likely to require external funding. Donor funding is not a reliable source over time, however, and the central or local government must be willing to pick up these costs within a reasonable timeframe. Thus, for example, the key long-term issue in the continuation of the TOM program in Honduras is: What will happen when USAID support ends?
- *Clearly defined system.* A successful backup support system for rural communities must be very well defined. The ratio of promoters to communities, the number of visits made each year, the kind of training that is required, the reporting requirements, and the roles

and responsibilities of the promoter are key elements that must be the basis of the program. Both the Honduras and Nicaragua cases address these very well.

- *Monitoring and evaluation.* A simple and understandable monitoring and evaluation system is an essential aspect of providing backup support to rural communities. In both the municipal promoter model in Nicaragua and the TOM program in Honduras, workable information systems have been established that provide the data that allow the promoters to target their efforts. In fact in Honduras, the classification system actually provides an incentive for the promoters to have as many systems under their responsibility classified in the highest category as possible.
- *Competent institutional support.* The presence of a capable institution, probably but not necessarily governmental in nature, with clear responsibility for the provision of WS&S services in rural areas, is an important prerequisite. That institution must have operational responsibility for the program—a backup support program needs a competent institution behind it. The institution could be regional or national in scope.
- *Regulatory reform.* Interestingly, comprehensive regulatory reform does not seem to be a key element of setting up an effective backup system in rural areas. However, regulation in certain key areas such as technical norms and standards and water quality is needed. Regulatory standards are usually within the purview of the responsible government agency and do not require legal changes. Certainly in Honduras, the SANAA TOM system was set up despite the absence of regulatory reform. Most of the legal and regulatory reform efforts in the region have been virtually silent regarding service provision for rural areas. If clear responsibility for providing backup support to rural areas resides within one institution (at least on paper), as is the case in most countries, then it seems that a backup system could be set up without comprehensive legal and regulatory changes.
- *Lack of attention to health.* Health is clearly a secondary concern compared to operations and maintenance of the water supply system. Although sanitation is nominally part of both the TOM program in Honduras and the municipal promoter model in Nicaragua, in reality it is not given much attention. Similarly while hygiene education and behavior change are acknowledged as important, they are not a major concern. Lack of resources may be part of the reason for this shortcoming, but the more central issue may be the greater priority given to technical and management matters by the program. In each of the programs, much more coordination is needed with local health officials.
- *Lack of attention to environment.* Environmental concerns are given even less importance than health. While environmental awareness in such areas as watershed protection and water quality is more apparent than was the case ten years ago, very little attention is actually given.
- *Cost recovery.* Full cost recovery remains an elusive goal in rural communities. The cases indicated that significant progress is being made in recovering recurrent costs, but



they did not demonstrate progress in meeting capital costs or depreciation. While the long-term goal of full cost recovery should not be abandoned, these cases indicate it is not a realistic goal in the near- or medium-term in the less developed countries in the region.

- *Role of technology.* In the cases from Honduras and Nicaragua, the technologies used were very simple—gravity-fed systems and rope pumps. It is not clear how well the model would work if the physical conditions required more complex and harder-to-maintain technologies such as motorized deep-well pumps. More complex technologies would certainly be more difficult for communities to maintain.
- *Role of municipality.* It is unlikely in the foreseeable future that municipalities will be able to play the lead role in providing backup support to rural communities. While the Nicaragua case study demonstrates that municipalities can indeed play an important role in providing support, it also shows that without the support of the regional office of ENACAL, the model would not have been successful. This is an important issue since some have argued that the primary responsibility for supporting rural WS&S systems should lie with municipalities.

### Regulation of Services in Small Municipalities

- *Effective regulation.* Establishing an effective regulatory framework for small towns is not easy. The sheer number of small municipalities, the lack of resources, the halting or uneven pace of movement toward decentralization in general, and the poor condition of the facilities present formidable challenges. In addition, there are real differences of opinion in some countries on how best to reform the sector and regulate services. Some favor private sector solutions. Others favor municipally-based solutions. No country surveyed provided an adequate example of a regulatory environment to develop a case study. Although Nicaragua has enacted the most comprehensive reform and has established a regulatory framework, the actual effect on improved services has not yet been felt. Clearly regulation is a difficult task and one that will require more experimentation. Countries are grappling with this issue, and in the future there will be more experiences to examine.
- *Proceed slowly.* Perhaps the most important conclusion in the area of regulation is to proceed slowly and with a light touch. Going from a complete absence of regulation to a highly regulated system is unlikely to work, if for no other reason than the cost required to implement it. Regulation requires information systems that provide reliable data; most countries are not yet in a position to collect and analyze a large amount of data. Determining, from the start, what the regulatory priorities are and focusing on them are keys to a good data collection system.
- *Role of municipal regulation.* All regulation does not need to occur at the national level. In the near and medium term, it is not realistic or even desirable to expect national governments to be responsible for all regulation. The information systems required to

effectively monitor and enforce regulation do not exist in most countries and even if desired would take time to develop. In San Julián, in the absence of an effective national regulatory framework, regulation is provided through municipal ordinances. Local regulation should be considered an important aspect of a national system of regulation. At a minimum, national governments should be responsible for setting water quality norms, technical norms and standards, and environmental standards. In addition, the national government should regulate the rate of return and provide a structure to prevent monopolistic behavior of private sector firms. The key conclusion is that countries should make use of both local and national government regulation.

## Summary

These case studies show what can be achieved when local communities are given increased responsibility. The case studies do not advocate for a particular institutional model; rather they illustrate what several countries and municipalities have done and allow key lessons to be passed on to a wider audience. Many countries are grappling with the three issues discussed in this document—management models for small towns, backup support to rural communities, and regulation of municipal services. The case studies and resulting conclusions offer valuable insights as others work on these same issues. The conclusions drawn in this chapter are not intended to be the last word on the subject but to offer some insights for consideration by others.

Where do we go from here? What do the lessons from these case studies imply for the future? Below are five broad agenda items for those development organizations interested in the decentralization of WS&S services.

- *Continue to track the experimentation in decentralization to see what lessons emerge.* Given the number of countries that are using decentralization as the approach to reform their WS&S sectors, there will continue to be examples from which to draw lessons. Which models work best in which situations? What can we learn about scaling up successful approaches? The experiences can answer these and other questions.
- *Determine the effect on these models of paying more attention to sanitation.* If small municipalities and rural communities increase their emphasis on sanitation, it will be important to assess the effect on different management models. Given the complexity and cost of providing sanitation services, communities may not be able to use these same models in their current form and provide both high quality water supply and sanitation services.
- *Continue to search for solutions to the problem of financing capital investments.* Although this issue is not new and many approaches have been tried, financing remains a major stumbling block to scale up of any successful management model. Current efforts are underway to use private sector capital, but there is little documentation of this approach for small towns and rural areas. National governments and donors

continue to provide capital investment to local governments and rural communities primarily through grants. Coming to terms with this reality or finding innovative solutions will be an ongoing issue.

- *Development of regulatory approaches.* Given the poor track record of countries in regulating the sector, finding effective approaches to regulation should be an area of emphasis. In particular, finding the balance between municipal and national level regulation—i.e., spelling out which areas of regulation each level should be responsible for—will be an important subject to study.
- *Addressing health and environmental concerns.* Although there is increased awareness of the importance of health and environmental concerns, in fact not much progress has been made. Ways of better coordinating and integrating efforts of providers of WS&S services and health and environment agencies should be explored. Since WS&S agencies often do not have health or environmental expertise, it may be more productive to create links among those that do, especially at the local level. Developing approaches whereby local utilities and ministries of environment and health can better coordinate and integrate their activities may hold promise for addressing health and environment issues