

Water Management Decentralization
in Rural Honduras

by
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Numerous water supply systems and community based water boards have been created with the aid of international organizations and NGOs in developing countries. These water systems have great potential to improve people's social life and health in these countries. However, in reality, these water systems are often not effectively managed; often, they do not function well and are abandoned before the designed lifespan. Water boards, the community based organizations established to run the systems, could also stop functioning. At the same time, a highly centralized water and sanitation sector, which many of the developing countries have, results in lack of governmental assistance, especially in rural areas. One of the future directions to overcome this situation is decentralization, which gives more authorities to local governments and water boards.

Honduras is a typical example of this water management issue, yet with high potential to be a future successful model for the decentralization. Since the 1990s, the national government has been trying to decentralize its water and sanitation sectors to give more authority to municipalities and local water boards in rural communities. At the same time, both government and community based organizations have been allocating circuit riders to visit the communities to provide technical and administrative assistance.

Despite these efforts, there are still problems associated with water management and the decentralization processes. This study attempts to fathom the current issue pertaining to water systems and water boards in Honduras, particularly the impact of decentralization and the need for assistance in rural communities. I interviewed six water boards in three different rural areas to identify the current issues.

In addition, related articles and the national laws were reviewed to understand the process of decentralization and the institutional structure of the water and sanitation sector.

The study revealed that the rural communities have enough potential to administer their own water systems. However, they have not obtained much benefit or authority from decentralization. None of six communities interviewed is receiving regular support from the government. There are two communities which get regular external assistance and they are having less concern and are confident about maintaining the water systems. On the other hand, communities without any regular external assistance are experiencing difficulties in operating their water systems. In addition, there is less trust among people in these communities to get support from the inside.

The study suggests that the national government should still proceed with decentralization but provide more financial and educational support to empower local governments and rural communities. In addition, local governments should facilitate cooperation between communities and resolve conflict between them. However, the most important thing is for rural communities to improve the situation by joining an organization which provides regular assistance or creating similar organization by themselves.

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APPROVED:

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I understand that my thesis will become part of the permanent collection of the Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

Yoshiko Sano, Author

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Water Management Decentralization in Rural Honduras

Chapter 1. Introduction

1.1 Background

Access to clean water is the most basic requirement for humans to live a healthy life. For example, diarrhea, a waterborne disease, kills more than 1.8 million children per year (WHO, 2009). There are about one billion people who still do not have access to clean water. Women and children travel long distances to get water and this situation is worse in rural areas compared to urban areas (UNICEF, 2009). Central America's water problems are exacerbated by an uneven population distribution, whereby 66% of the people that live on the Pacific Coast, where only 30% of the water resources occur. . The rapid rate of deforestation is affecting both the quality and quantity of the water resources available in this region (GWP, 2009).

Many international organizations and NGOs have built water wells and gravity fed water systems in rural communities of developing countries. Honduras has received this benefit especially after Hurricane Mitch hit in 1998. However, most international organizations or NGOs rarely return to see if the water systems are working or to provide funding for maintenance and operation. That is often left as a responsibility for the communities. Those organizations educated community members to be plumbers and create water boards (*juntas de agua*) to collect water tariffs, and maintain and operate the water systems that they build. At the same time, sustaining the water board while collecting enough money to maintain and operate the water system is not easy for the community members who have never done this. The water systems can also be damaged by natural disasters, get old, or be stolen.

Therefore, many of the water systems are not used after several years and people lose their access to clean water. This is not only happening in Honduras, but in other developing countries.

In addition, national governments are not working properly in Central America due to centralized and fragmented water governance administration (GWP, 2009). Therefore, the rural communities cannot depend on them for support. However, it is not possible to depend upon external funding or organizations to support the sector forever. Ideally, national and local governments are the ones who need to be fully responsible in supporting their citizens.

To improve the situation, many developing countries have introduced decentralization of the central government in several sectors including the water and sanitation sector. The decentralization is mainly encouraged by international organizations such as the World Bank. Even though it is still not clear what the benefit of decentralization is, especially in developing countries (Bardhan, 2002), decentralization has some positive effects. For example, decentralization improved citizen participation by bringing decision making closer to the local citizens (World Bank, 2003). This makes it easier for remote communities to reach the national government via local governments to request support and lobby for efficient use of the national budget. .

This research will examine the situation in the rural areas of Honduras to discover if government has reached the rural communities, and, if not, ways to improve the situation, and finally, how to make the developing countries self sustaining with respect to water and sanitation.

1.2 Aim and Research Question

The aim of this research is to identify how national and local governments can enhance their capacity to improve the water and sanitation sector in rural areas by funding the real needs in rural communities. However, government policies cannot be changed quickly. Therefore, it is also important to find out how rural communities can improve their situation by themselves.

The research questions are:

1. What is the process of decentralization of the water and sanitation sector in Honduras?
2. What kind of situation are rural communities facing and what are their needs for support?
3. Has the effect of decentralization reached the rural communities yet? Is there any evidence of improvement in this situation?
4. Is there any way that rural communities can support themselves without governmental assistance?

1.3 Methodology

A literature review and interviews were conducted to understand the process of decentralization and to analyze the related law, regulations, and organizations. Personnel from the SANAA Development Division, the AHJASA Headquarters, the Peace Corps office in Honduras, the USAID office in Honduras, the Agua Para el Pueblo Headquarters, and the Copan office of Pure Water for the World were interviewed to understand what kind of support they provide to rural communities.

For finding out about the particular situations and present needs, interviews

with members of *juntas de agua* in six communities in three regions of Honduras were conducted during a field study in May 2008. The questionnaire (Appendix) was designed to collect data about the function and condition of the water systems and *juntas de agua*. Some of the community members were also interviewed to learn their daily involvement in their communities. Qualitative analysis was done based on the interviews, to compare the situation between each community, and to understand the differences and the similarities in situation. In addition, recommendations are given to improve the situation.

This thesis is organized to explain the basic characteristics of Honduras. Then it will describe the laws, regulations and organizations which are related to the water and sanitation sector in rural areas to give a basic understanding of the legal and institutional situation in Honduras. Next, the results of the interviews done in six different communities will be presented. Lastly, the thesis will discuss the problems in the water and sanitation sector and recommend how they can be solved to better support the rural communities.

Chapter 2. Overview of Honduras

2.1 Country Background

Location and Land Use

Honduras is located in Central America, sharing a border with Guatemala on the west, El Salvador on the southwest, and Nicaragua on the south and east. It is bordered on the north by Caribbean Sea, the east by the Atlantic Ocean and on a small portion on the south by the Pacific Ocean (fig 2.1). Total surface area is 112,100 km² with 26% agricultural land (2000) and 41% forested area (2005) (FAO AQUASTAT 2008; World Bank 2008b). Honduras is a hilly country where 85% of the land is covered by slopes greater than 12%. Most of the flat fertile lands are occupied by large farms, ranches, or international fruit companies.



Figure 2.1 Map of Honduras
(<http://www.lib.utexas.edu/maps/americas/honduras.jpg>)

Most of the poor rural population is being forced away to the marginal hillside region. Many hillsides have been degraded because of deforestation and erosion caused by poor farmers (Barbier & Bergeron, 2001). Even though there are several nature reserves to protect the forest, much illegal logging continues (Wade, 2007). Deforestation also affects the water resources throughout the country and this increases the impact of hurricanes.

Climate

Climate in Honduras can be categorized into three types according to the country's physiographic regions. The Caribbean lowlands have a tropical wet climate with rainfall throughout the year. The Pacific side of the lowlands has a tropical wet and dry climate with a distinct dry season from November through April. The interior highlands where the capital Tegucigalpa is located, have a distinct dry season with the temperatures depending upon the elevation (Merrill, 1995). Average annual rainfall varies from more than 3,000mm in the La Mosquitia region to fewer than 900mm in Tegucigalpa (World Climate, 2009).

Honduras is also located along hurricane belt and the country is struck by a huge hurricane once in a while. For example in 1998, Hurricane Mitch hit the county leaving 5,657 people dead, 8,059 people missing 12,272 people injured and US\$ 3.8 billion in losses (IDB, 2008). It has already been over ten years since the hurricane, but the country has not fully recovered. .

Population and Administrative Jurisdiction

Honduras has a population of 7.1 million and 51% is below the national poverty line. Population is still growing rapidly and urbanization is going on, but 53% of the population lives in rural areas (World Bank, 2008b). Almost 30 % of the population engages in agriculture (2006), but this number is gradually decreasing (FAO, 2009).

The country is divided into 18 departments (*departamentos*), 298 municipalities (*municipios*), and 3,740 villages (*aldeas*) and 19,937 settlements

(*caseríos*). Each municipality has its administrative seat in a town of the same name, and this town is usually, although not always, the largest population center in the municipality as well. Those counties are administered by elected mayors (*alcaldes*) who are the head of the local government (Zerbock, 2005).

Industry

The main industry in Honduras is agriculture, specifically coffee, bananas, and shrimp. Those products are mainly exported to the U.S. and other countries (MOFA, 2008). Honduras has heavily depended on banana exports since the first boatload of bananas was sent to New Orleans, U.S. in 1889. However, most of the banana plantations are owned by Dole Fresh Fruit International and Chiquita Brands International which are U.S. companies (Merrill, 1995). Mining and maquiladora industries are growing industries in the country. Erosion and water pollution problems have been caused from these industries (Zerbock, 2005). In addition, their business is highly dependent upon exporting materials and highly sensitive to the price change.

Government and Politics

Honduras won independence from Spain in 1821. After independence, the country experienced nearly 300 internal rebellions, civil wars, and changes of government and decades of military rule until a democratic tradition was established in the early 1980s and continues until today (USAID, 2008). A president is elected every 4 years and reappointment is not allowed (MOFA, 2008). However, when President Manuel Zelaya planned to hold a non-binding public consultation to ask

citizens if they would allow the president to succeed himself. In response, a military coup occurred on 28 June 2009 and the President was exiled. (BBC, 2009). In light of this event it seems the country is still struggling to fully stabilize and achieve democracy.

Governance is one of the biggest problems in developing countries like Honduras. There is a lack of transparency and a lot of corruption in the politics and public administration, resulting in little trust of government by citizens, and resources that do not reach the poor who most need them. One of the reasons for the lack of transparency and corruption is the centralized and oversized government and public sectors working with low effectiveness and efficiency. Many of developing countries are in the same situation and it has been suggested that they decentralize the government to increase citizen participation in the decision making process.

The water and sanitation sector is one of the target sectors for decentralization to reduce child mortality and improve access to drinking water and sanitation. However, the decentralization process is slow since local governments do not necessarily have enough capacity and money to carry out the task (Republic of Honduras, 2001).

2.2 Water Resources

Honduras has 29 main river basins including 6 international river basins: Choluteca, Coco/Segovia, Goascorán, Lempa, Motagua, and Negro (Atlas, 2007 & TFDD, 2009). The total annual water resource, crudely approximated by multiplying average annual precipitation by land area, is 90,031 million m³/year. This

number is not necessarily the same as the total amount of water available for human and environmental uses, and only 1.9% of them are used. Groundwater is also an important source of clean water in dry areas and big cities like San Pedro Sula. However, data about groundwater are very limited (Ballesterio et al., 2007).

Since agriculture is the main industry in the country, 82% of the water exploited in the country is used for agriculture and 7.7% of that water comes from groundwater (Ballesterio et al., 2007). However, only 18.5% of agricultural lands are irrigated and these lands are mostly for bananas, cantaloupe and sugarcane plantations in the flat land (Republic of Honduras, 2001; Ballesterio et al., 2007). Most of the small farmers live on the hillside and they depend on the rainwater for cultivation.

Approximately 70% of rural areas and 90% of urban areas had access to drinking water in 2002. They are trying to achieve 95% by 2015 in the whole country as a part of the Millennium Development Goals (ERSAPS, 2003). However, access to water does not necessarily mean they have access to water 24 hours per day for 7 days a week. Honduras is located in tropical region and seems to have abundant water, but since many parts of the country have distinct dry seasons from November to April, they experience drought later in the dry season which causes water shortage in some parts of the countries every year.

Water quality is also a huge problem since waterborne disease is the biggest cause of disease and second cause of child mortality. Less than 15% of the water has been treated by chlorine in the rural areas. The wastewater treatment rate is also very low even in urban areas, and almost nonexistent in rural areas. Most of the wastewater is directly discharged to streams or sea (ERSAPS, 2003). The rapid rate of

deforestation adversely influences water quality by increasing erosion (Batbier, 2001).

Drinking water in rural areas is taken from small streams, springs or groundwater. The amount of water is not necessarily enough or clean since many of the water sources are adversely affected by untreated waste water and deforestation.

Chapter 3. Water Institutions and Legislation in Honduras

3.1 Introduction

Many of the rural communities in Honduras have received support from the government, international organizations, NGOs and occasionally private corporations to implement water systems in their communities. However, the maintenance and operation of the water systems are the responsibility of the rural communities. Many of the rural communities have created water boards called *juntas de agua* to manage these systems. However, community members do not necessarily have enough experience and knowledge to sustainably manage, operate, and administer both the water system and the *juntas de agua*. They need outside support to improve the situation.

This chapter will describe the past and current system of laws, regulations, and organizations created as a result of decentralization related to the water and sanitation sector in rural Honduras.

3.2 Overview of the Water and Sanitation Sector

In Honduras, there are many organizations related to the water and sanitation sector but their roles and responsibilities are unclear and overlapped (see fig. 3.1). There is no organization overseeing the situation (Phumpiu, 2008). However, there are several main organizations responsible for managing the water systems in rural communities.

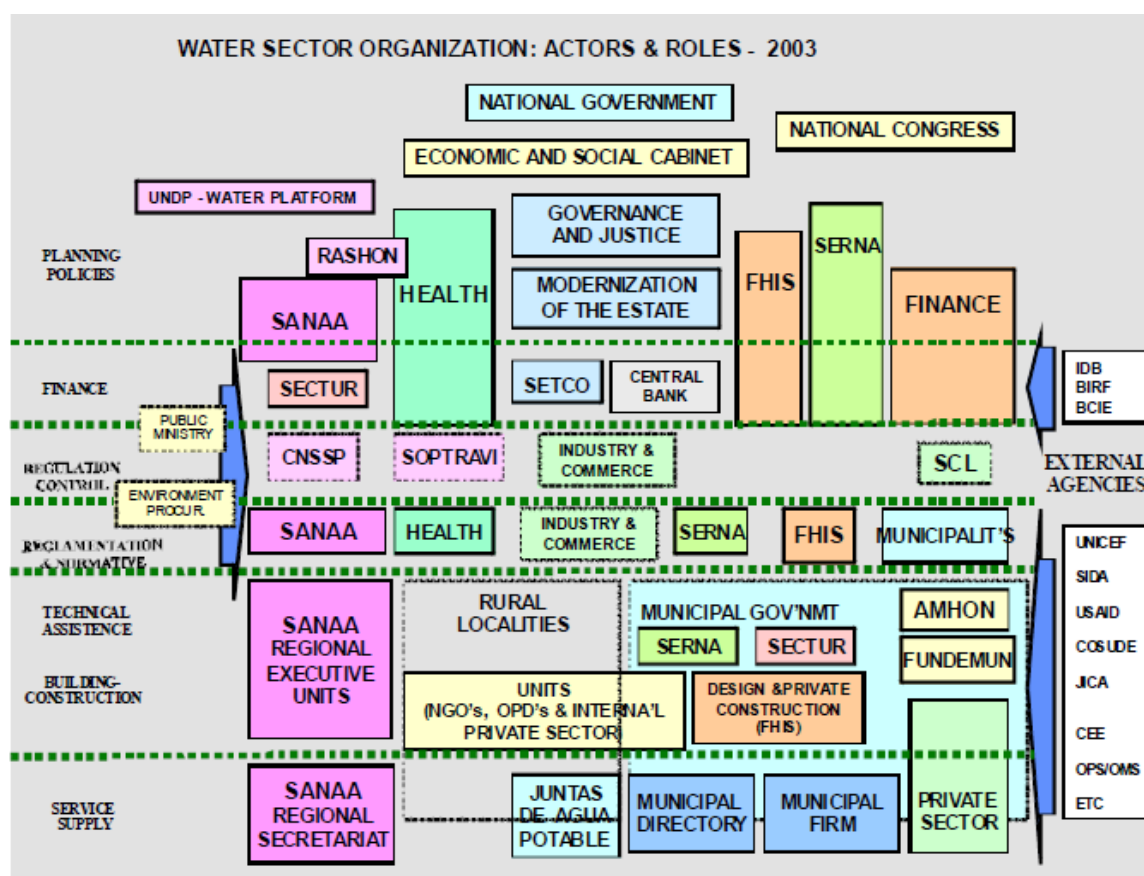


Figure 3.1 Organization of the Honduran Water Sector in 2003.
(Phumpiu and Gustaffson, 2005)

The National Autonomous Aqueduct and Drainage Service (*Servicio Nacional de Acueductos y Alcantrillados* or *SANAA*), established in 1961, has been the main actor in Honduras maintaining and having legal responsibility for water supply and sanitation. Until then, drinking water was provided by the municipalities. However, some of the municipalities continued to provide the water supply even after 1961. Later on, in 1990, Municipality Law (*Ley de Municipalidades*) gave authority to the municipalities to construct, manage and administer the water and sewage systems and some cities have chosen to privatize the water sector, e.g., San Pedro Sula and Puerto Cortés. In the rural area, water boards which are called *Juntas Administradoras*

de Agua y Saneamiento (*juntas de agua* from now on), were formed based on the community members' desires to take care of their own water systems (ERSAPS, 2003).

In 1995, decentralization and privatization actions were started by the Public Sector Reform Program (PSRP) of the Inter-American Development Bank (IDB, 1995). The Poverty Reduction Strategy Paper (2001), prepared by the Honduran government in assistance with World Bank and International Monetary Fund, came out in 2001 with targets to “achieve 95% access to portable water and sanitation” and “reduce maternal mortality by half” by 2015.

Based on these movements, the Framework Law for the Drinking Water and Sanitation Sector (*Ley Macro del Sector Agua Potable y Saneamiento*) and Water Platform were established in 2003. This law decentralized SANAA and established the National Commission for Sanitation and Water (*Consejo Nacional de Agua Potable y Saneamiento or CONASA*) and the Regulatory Entity for the Drinking Water and Sanitation Sector (*Ente Regulador de los Servicios de Agua Potable y Saneamiento or ERSAPS*). The proposal for the water sector organization is show in figure 3.2. However, these two organizations are under the influence of SANAA; many of the personnel are from the SANAA and they have not started functioning well yet (Phumpiu, 2008).

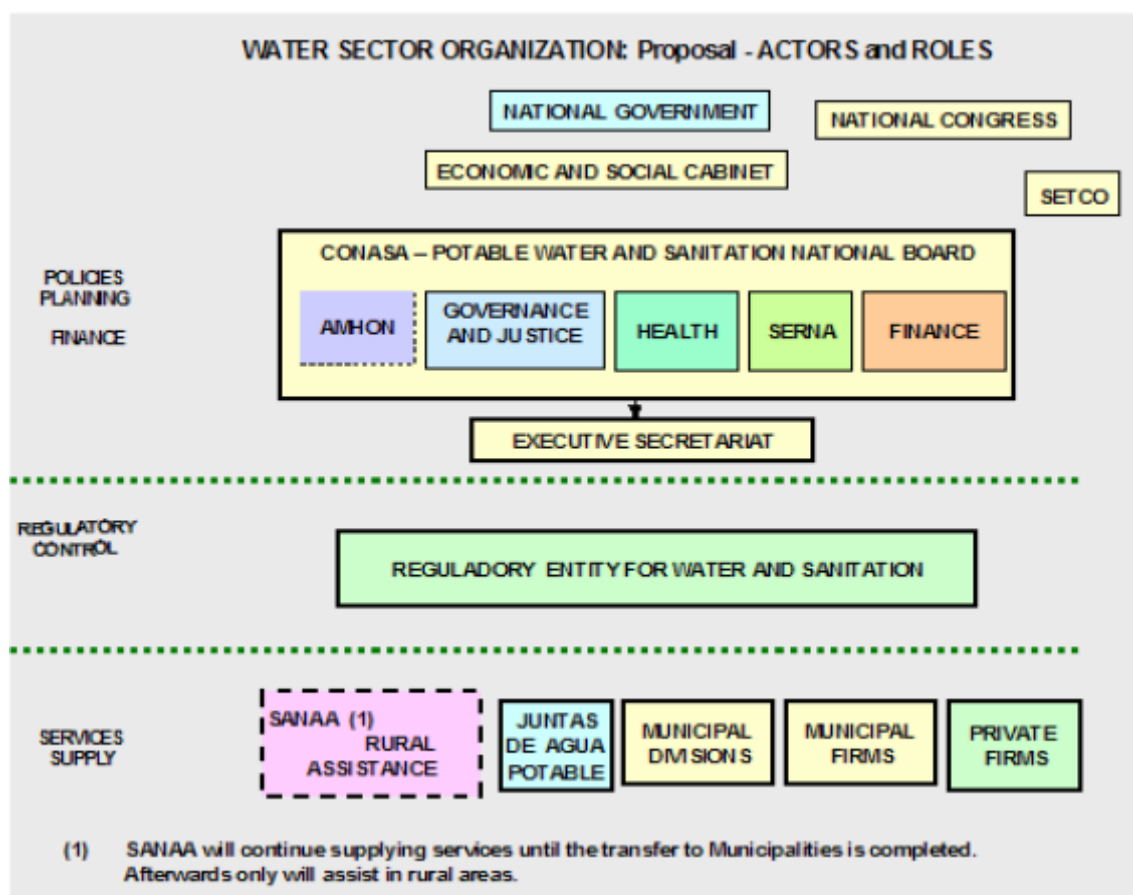


Figure 3.2 Proposal for Water Sector Organization
(Phumpiu, 2008)

Decentralization of SANAA does not only mean creating these two organizations, but also returning the authority of water supply and sanitation to the municipalities by 2008. This means municipalities will also need to take care of the rural communities in their area. Obviously, this has not been done by 2008 and they are still in the process of doing so. The process of municipalization is not moving well because many of the municipalities do not have enough knowledge to accomplish this task and the government is not providing enough funding for this. There are also some problems because SANAA is unwilling to give the authority to the municipalities since it means they will lose power and personnel and have to provide severance

allowances. Therefore, municipalization is still in the process for the water and sanitation sector (Phumpiu 2008; SANAA, 2008b).

However, most of the rural communities have their own *juntas de agua*, taking care of their own water systems. In 2006, Regulation for *juntas de agua* (*Reglamento de Juntas Administradoras de Agua*) was stipulated, based on the Framework Law and it recognized *juntas de agua* as having the authority to manage their own water systems if they are legally recognized as a legal entity (*personalidad juridica*).

3.3 Related Laws and Regulations

Law of National Water Use, 1927

The Law of National Water Use (*Ley de Aprovechamiento de Aguas Nacionales*) in Honduras was written in 1927 and modified twice in 1932 and 1945.

In Honduras, water belongs to the State, which has full control of it (art. 1). However, waterways having their source and terminus on the same property, rainwater falling on private property as long as it is contained thereon, and groundwater found by the landowner beneath her/his land are private (art. 3). The law also ensures the rights of general public to use water for drinking, washing, bathing and for the watering of cattle (art. 9). The landowner is also allowed to dig an “ordinary well” on her/his land for domestic purposes (art. 12) (FAO/WHO, 2009).

The Law defines the priority of the water as below (art. 25):

1. water supply for domestic use;
2. use of water for railways;

3. water for irrigation purposes;
4. water for the construction of navigable channels; and
5. use of water for coffee plants, mills and other industries and for the production of hydroelectric power.

Water supply for domestic use is defined as the primary priority and the Health Code (*Código Salud*) also clearly defined that water for human consumption has more priority than any other option (art. 33, Health Code). The second priority is the use of water for railroads and is unique to this law which favored the railroads as the means to transport bananas to the coast from the inland for export. It is even possible to sense that there was a lot of influence of booming banana and coffee plantations and trade at this time in this law simply by looking at the priority of the water use in this article.

The law was written when there were fewer than three million people in the country, which has now grown to more than seven million people. Since pollution issues were not very apparent at that time, the law does not regulate water pollution (Honduran Water Platform, 2007). The Law also does not contain an article about managing water resources. Therefore, the General Water Law is being developed to regulate water resources in an integrated way. However, this law involves so many stakeholders that the approval of this law has been very difficult which will suppose to take a little more time to be complete (Peace Corps - Honduras, 2008).

General Environmental Law, 1993

The Law of National Water Use does not have any article related to water pollution, but in art. 32 of the General Environmental Law (*Ley General de Ambiente*)

it is forbidden to discharge polluting waste whether solid, liquid, or gaseous into continental and maritime waters which affect water quality or the biological balance (FAO/WHO, 2009). However, even in areas with sewer pipes the wastewater is not treated and discharged directly into rivers or the ocean (ERSAPS, 2003).

Framework Law for Drinking Water and Sanitation Sector, 2003

In 2003, the Framework Law for Drinking Water and Sanitation Sector (*La Ley Macro del Sector Agua Potable y Saneamiento*) was passed which mandates by October 2008 the decentralization of SANAA and transfer of assets to the municipalities to provide water and sanitation services. This law requires municipalities to set up autonomous service providers and creates the National Council for Water and Sanitation (*Consejo Nacional de Agua Potable y Saneamiento or CONASA*), and the Water and Sanitation Sector Regulator (*Ente Regulador de los Servicios de Agua Potable y Saneamiento or ERSAPS*) to be responsible for water sector coordination and planning. SANAA is expected to remain as a technical assistance agency supporting small service providers as well as serving as CONASA's technical secretariat.

One of the other objectives of this decentralization is to provide for municipal authority to manage water supply through private operators, but it is not a requirement (Benítez Ramos, 2005; World Bank, 2007). However, this process was not finished by October 2008 and both CONASA and ERSAPS are not yet fully functional. The central government is going through this process without enough funding and training for municipal governments and it has not been an easy process for any of them

(Phumpiu, 2008).

In rural areas, *juntas de agua* and community organizations will have preference in having the authorization for the total or partial operation of drinking water and sanitation services in their respective communities (art. 17). This law also provides opportunities for *juntas de agua* to be recognized as legal entities (*personalidad juridica*) and defines the organization and function of *juntas de agua* (art. 18). Later on, more detailed regulation for *juntas de agua* has been established in 2006 which is mentioned in next section.

The General Water Law is a macro-level law that considers water as a resource. On the other hand, the Framework Law is a micro-level law which regulates the water for consumption (Phumpiu, 2008).

Regulation of Juntas de Agua, 2006

The Regulation of *Juntas de Agua* (*Reglamento de Juntas Administradoras de Agua*) is based on the Framework Law creating norms and regulating the *juntas de agua* which were originally promoted by AHJASA. For decades there have been many *juntas de agua* in rural communities, but they were not legally recognized until the Framework Law or this regulation was created. However, *juntas de agua* still need to be recognized as legal entity (*personalidad juridica*) which is very hard and time consuming to accomplish. As a result, there are not many *juntas de agua* that are legal entities. This means that when there is a water system problem in the community, the *juntas de agua* could be seen as illegally operating the water system if they are not a legal entity (SANAA, 2008b). To be recognized as a legal entity is also a condition to

receive technical and financial support from the state (art. 24).

This regulation provides detail about how *juntas de agua* should be formed, conditions of the services, rights and obligations of both users and the *juntas de agua*, claims, protection of the water, pricing, and infractions and sanctions. The *juntas de agua* are mechanisms for community participation in the operation, maintenance and administration of drinking water and sanitation systems (art. 7). Below are the objectives of the *juntas de agua* written in the regulation (art. 8):

- a. operate and maintain the drinking water system to offer water supply service to the population;
- b. administer the water system as sustainable business;
- c. promote community participation in the construction, operation, maintenance, and administration of drinking water and sanitation systems, as well as protection of water quality;
- d. promote drinking water and sanitation services in its area;
- e. promote education in health and correct use of the water;
- f. protect the basins that provide the water source;
- g. ensure that management of the waste (liquid, gas and solid) is adequate according to laws, norms and regulations; and
- h. properly dispose of excreta.

The *juntas de agua* need to have their own statutes (art. 9), and the organization is consists of Assembly of the Users, Board of Directors, and Support Committees (art. 10). The Assembly of the Users has the maximum authority of the *juntas de agua* and they elect the Board of Directors and Support Committees, and approve the rate of tariff (art. 11). The main responsibilities of the Board of Directors are to approve annual budget proposal and propose the tariff to the Assembly of Users. It is

comprised persons listed below (art. 12):

- a. President
- b. Vice President
- c. Secretary
- d. Treasurer
- e. Prosecutor
- f. Vocal I
- g. Vocal II

Vocal is a board member who replace other members, except the president, when they are absent. He/she could also carry out specific works entrusted by president

It is defined in the regulation that SANAA is the agency which gives administrative and technical support to the *juntas de agua* in both rural and urban environment. SANAA has the attributions and obligations as follows (art. 26):

- a. offer technical support and permanent training to *juntas de agua* for the installment of the services;
- b. offer technical support for the design and construction of drinking water and sanitation projects;
- c. promote the formation of *juntas de agua* in the communities without services through the support to the community organization;
- d. support the *juntas de agua* in the procedure to be recognized as a legal entity;
- e. promote the *juntas de agua* for projects to improve technical, legal, institutional and financial-economic conditions in a refundable or non-refundable way;
- f. sign agreements of works and/or services with the *juntas de agua*;
- g. supervise the administration and operation of the *juntas de agua* through agreement with the Regulating Entity; and

h. protect surface water and groundwater quality.

Juntas de agua should also consider preservation of water sources for sustainability and improvement as priority activities (art. 44). The rates of the tariff need to reflect the actual cost of the services which include the recovery of the cost of operation, maintenance and administration of the systems and necessary expense to maintain the environmental sustainability (art. 48). They are also required to consider reducing the rates for the low income populations.

Forestry, Protected Area and Wildlife Law, 2007

In 2007, the new forestry law was approved by the National Congress. It contains the article allowing the communities or municipalities to request protection of the watershed from which they obtain domestic water by the National Institute of Conservation and Protected Forest Area and Wildlife Development (*Instituto Nacional de Conservación y Desarrollo Forestal Áreas Protegidas y Vida Silvestre* or ICF) (art. 65). The law also does not allow one to cut, damage, burn or destroy the trees, bushes and forests in general, and reforestation is recommended in the protected areas. In addition, this law prohibits construction, agriculture and livestock grazing in the protected areas. This does not mean if someone is doing the farming before the land has been claimed as protected area they need to stop farming. They are still allowed to farm, but urged to introduce agroforestry (art. 123). The law gives power to the communities to protect and manage their watersheds for their own drinking water.

3.4 Related Agencies and Organizations

Juntas de Agua (Water Board)

The function of *juntas de agua* has been explained previously in the Regulation of *Juntas de Agua*. They are community organizations which maintain, operate and administer community water systems. They are not only common in the rural area, but also in suburban areas. Some *juntas de agua* also provide education on water use and sanitation to the community and do watershed protection projects. There are more than 5,000 registered rural water systems in the rural as reported by SANAA. That means there are at least one *junta de agua* for each of the systems (SANAA, 2008a).

SANAA

In 1961, The National Autonomous Aqueduct and Drainage Service (*Servicio Nacional de Acueductos y Alcantrillad or: SANAA*) was established as the only organization in Honduras to manage the water and sanitation sector of all 300 municipalities. However in reality, SANAA became the service provider for at most 40 municipalities. This is because SANAA never had enough people and resources to administer all the systems and also some of the municipalities refused to be managed by SANAA. Therefore, SANAA started to give more and more responsibility to the *juntas de agua* to take care of their own communities by themselves in rural areas. In the 1980s by the World Bank advocated for small central governments and strong local governments which led SANAA to give the authority to manage the water system back to the aforementioned 40 municipalities. This has been encouraged more

with the Framework Law. Now, SANAA is transforming from a service provider to a technical advisor but this process is not necessarily going well (SANAA, 2008b).

In rural areas, SANAA has focused on the communities between 200 and 2,000 residents to provide water systems with one tap and latrine to each house and sanitary education to the communities. This is because if there are fewer than 200 people, the houses are too dispersed and the system will be too expensive for them to maintain. On the other hand, if there are more than 2,000 people, it is hard for the communities to have the same interest and to work together for it (SANAA, 2008b).

Each local office of SANAA is structured as shown in fig. 3.3. Water and Sanitation Technicians (*Técnico en Agua y Saneamiento; TAS*) and Operation and Maintenance Technician (*Técnico en Operación y Mantenimiento; TOM*) visit each community to help and educate the *juntas de agua* and community members. TAS mainly takes care of the technical issues related to construction of the water systems. On the other hand, TOM enables the *juntas de agua* to function sustainably by giving both technical and administrative assistance (SANAA, 2008b). The concept of TOM is patterned after the “Circuit Rider” of the National Rural Water Association in the U.S. which gives on-site technical and management assistance to local public and private small scale water and wastewater systems (Trevett, 2000). Each TOM is assigned to 50 communities and they visit each community at least twice a year. However, there are only 65 technicians because of financial constraints, and to cover all the more than 5,000 communities SANAA needs more than 100 of them (SANAA, 2008b).

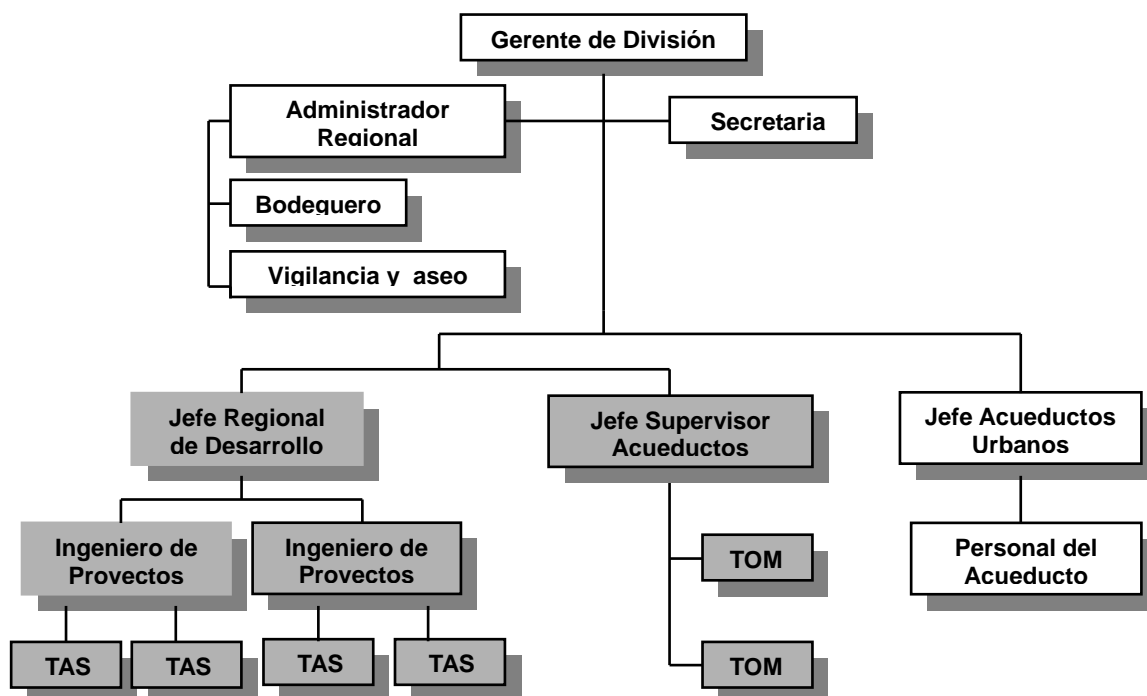


Figure 3.3 Typical Structure of a SANAA Regional Division
(Rivera, 2001)

At first, in communities without water systems, SANAA encourages them to have a water system and organize *juntas de agua*. Next, SANAA educates the communities on how to build the system. SANAA usually provides materials like pipes and the community members provide labor and local materials. After the completion of the system, SANAA educates a plumber to operate and manage the system on a daily basis. The plumbers are always chosen from the local communities. Most of these technical and construction related works are done by the TAS (SANAA, 2008b).

Later on, the TOM visits the communities to check how they are doing with the system and advises them when necessary. The TOM does not only visit the

communities which have implemented the water system by SANAA, but also any other communities which have water systems regardless of whether it was built by SANAA. The TOM needs to visit communities once in a while since both the water system and the *juntas de agua* can start declining in performance. In the study done by SANAA, only 6.75% of the water systems in 1996 were functioning well in the whole country. However, the rate has improved to more than 40% by the regular visit of TOM to the communities (SANAA, 2008a; b).

Right now, SANAA is receiving some income by providing services to several municipalities. After they fully transformed to a technical advisor, they are not supposed to generate any income and the government should provide funding for SANAA to operate. In a reality, the government is cutting funding and SANAA is finding it difficult to function. There are several national and international organizations which provide funding to SANAA but most of them prefer to build new systems and not repair old ones, give advice, or keep the organization running (SANAA, 2008b).

Secretary of Health

The Secretary of Health formerly had a planning role in determining policy, but water and sanitation projects were not done with great concern (Phumpiu, 2008). However, the Secretary has implemented water systems in rural communities which are smaller than those targeted by SANAA (SANAA, 2008b). The Secretary is also responsible monitoring sanitary control and water quality of the water supply for human consumption (Republic of Honduras, 2006).

Water Platform

The Water Platform was created by United Nations Development Programme (UNDP) to facilitate water institutional reform with the participation of 54 national institutions of civil society, government, and international organizations who are the main stakeholders. It was also targeted to create a dialog space for water governance to implement Integrated Water Resources Management (IWRM) in the country (Honduran Water Platform, 2007). The Water Platform has played a great role in decentralizing the sector after the creation of Framework Law and also developing the General Water Law (PAH, 2007; Phumpiu, 2008). However, since it is a group of many stakeholders, it has been very hard to organize and not many activities are done these days (Peace Corps - Honduras, 2008).

CONASA

The National Commission for Sanitation and Water (*Consejo Nacional de Agua Potable y Saneamiento or CONASA*) is one of the national agencies created through the Framework Law to be in charge of designing a nationwide policy. The responsibility of CONASA is to (i) design policy; (ii) develop strategies for water and sanitation national plans; (iii) define objectives and goals; (iv) invest in plans at urban and rural levels and coordinate with the actors such as municipalities; (v) coordinate activities of the public and private organizations related to technology, capacity building, improvement of the service and conservation of water resources; and (vi) develop methodology for water valuation (Phumpiu, 2008; Republic of Honduras,

2003).

ERSAPS

The Regulatory Entity for the Drinking Water and Sanitation Sector (*Ente Regulador de los Servicios de Agua Potable y Saneamiento or ERSAPS*) is another national agency created through the Framework Law. The main objective of the ERSAPS is to implement the policy made by CONASA and regulate the tariff system in the country (Republic of Honduras, 2003).

Municipalities

Municipalities have been given responsibility to manage their own water systems by the decentralization process introduced by the Framework Law. They are also going to be responsible for rural water systems. However, the central government is not providing enough funding to the municipalities to handle their own municipal water systems (Phumpiu, 2008). This means it will take a lot of time for the municipalities to be able to reach and support rural communities in remote areas.

AHJASA

The Honduran Association of Water System Committees (*Asociación Hondureña de Juntas Administradoras de Sistemas de Agua: AHJASA*) is an organization which gives educational support, and technical and administrative advice to the communities and *juntas de agua* created in 1990 with 17 communities from the Department of Valle in Southern Honduras with support from the International Rural

Water Association (IRWA), which was created by National Rural Water Association (NRWA) in the U.S. These 17 communities came together because they were having problem operating and maintaining their water system in the communities and eventually developed this almost nationwide organization (AHJASA, 2008).

The AHJASA does not build any water systems, but visits the member communities on a regular basis to ensure that water systems and *juntas de agua* are functioning properly. The people who go around to the communities are called “Circuit Riders” which is similar to the TOMs in SANAA. This Circuit Rider approach is used in the U.S. as it is mentioned above in SANAA section which introduced by NRWA. Circuit Riders educate the *juntas de agua* on technical and administrative skills. If necessary, they hold workshops for community members (AHJASA, 2008).

When communities need to implement water systems or need money to do some repairs or replace the systems, AHJASA will help the communities contact organizations who can fund those projects. There are now more than 400 member communities and each member communities which receives a Circuit Rider pays 3 Lps. as a monthly membership fee per household. However, they are not given any support from the government and do not have enough financial resources to cover the whole country (AHJASA, 2008; Trevett, 1998).

International Organizations, NGOs and others

There are many international organizations, NGOs, and religious or charity groups which fund the water and sanitation sector in Honduras from all over the world.

Some agencies like the U.S. Agency for International Development (USAID) funds SANAA and also have their own projects to protect micro-watersheds.

On the other hand, many NGOs and other small organizations fund small water projects in individual communities. This aid has been very important for Honduras to develop the water and sanitation sector. The aid has increased after the tremendous damage of Hurricane Mitch in 1998. However more than a decade has passed and the aid has been decreased (ERSAPS, 2003). It is time for Honduras to start standing up by themselves to improve the sector.

In addition, there is some danger on excessive dependence upon international or other external organizations. The idea of decentralization was introduced to the country by the outside (IDB), and this is the basic idea which World Bank, IMF, and other international banks are trying to implement in many of the developing countries. This is based on the idea that giving more power to the local governments will increase citizen participation (World Bank, 2003). At the same time, there are some criticisms about these banks implementing decentralization, and also privatization, which most of the time accompanies decentralization. These banks have been criticized as operating based on market fundamentalism or neoliberalism, and have not been successful in reducing poverty (Williamson, 2000).

For example, in Chile, water usage rights have been privatized by the Water Code in 1981 which was promoted by the World Bank as a successful model to attract private investment. However, mining and energy companies are the ones who have been benefited by this water right and local people are now struggling to get enough water. The environment is also at risk (The Patagonia Times, 2009).

The aim of the Framework Law created in Honduras is not only to decentralize the sector, but to privatize the water management. Privatization will not be much an issue in rural areas, since there is not much chance for private company to benefit. However, it is important for the government side to be strong enough and retain the water rights if they really want to serve water equally to their citizen.

3.5 Summary

This chapter provided an overview of the water and sanitation sector and the process of institutional reform by examining the related laws, regulations, agencies and organizations. Several laws and regulations were adopted and some agencies and organizations created based on them. However, many of them, especially on the government side, are not working well yet because of the lack of funding and enforcement. On the other side, most of the rural communities have *juntas de agua* and the community members are operating and maintaining their own systems by themselves. This is almost the only way that rural communities can obtain water and sanitation services, although there are organizations like AHJASA which give regular support to *juntas de agua*.

Chapter 4. Case Study: Six Rural Water Systems and *Juntas de Agua*

4.1 Introduction

The Framework Law for the Drinking Water and Sanitation Sector (*Ley Macro del Sector Agua Portable y Saneamiento*) was developed in 2003, initiating decentralization in the water and sanitation sector. The law stipulated that SANAA is to relinquish the authority to serve the municipalities and the municipalities given responsibilities to provide water and sanitation services in their regions. In the rural communities, *juntas de agua* have been legally authorized to maintain and operate their water systems.

Many of the water systems in rural areas were built by several national agencies, through international organization, NGOs, and others. However, management of these water systems after their completion has been not always easy. Therefore, members of *juntas de agua* in six rural communities from three regions of Honduras (fig. 4.1) were interviewed to determine: a) how well they are maintaining and operating the water systems; b) how well they are functioning; c) how much external support they are receiving; and d) what their needs are.



Figure 4.1 Rural Communities Interviewed
(Source: <http://www.lib.utexas.edu/maps/americas/honduras.jpg>)

4.2 Selection of Communities for the Case Study

At first, it was planned to interview only two communities in the municipality of Omoa in the Department of Cortés, but there were additional opportunities to interview four more communities in Municipality of Nacaome and Copán Ruinas in Department of Valle which were coordinated by Rolando López (table 4.1). The Honduran Association of Water System Committees (AHJASA) coordinated visits to Agua Friita and Santa Barbara. Christine Casey, who worked at Pure Water for the World in Copán Ruinas, suggested two additional communities, Quebracho and La

Estanzuela.

Table 4.1 Communities Interviewed

	Department	Municipality	Community	Access to town	Access to road
1	Valle	Nacaome	Agua Friita	20 min (car)	0 min
2	Valle	Nacaome	Santa Barbara	15 min (car)	0 min
3	Cortés	Omoa	Monte Vista	3 hours (mule)	2 hours (mule)
4	Cortés	Omoa	Nueva Vida	2 hours (mule)	1 hour (mule)
5	Copán	Copán Ruinas	Quebracho	15 min (car)	0 min
6	Copán	Copán Ruinas	La Estanzuela	10 min (car)	0 min

Interviews were conducted with the members of *juntas de agua* in each community and when possible, a few other people in the communities to learn the general situation of the rural communities (table 4.2). Interviews were done in Spanish through an interpreter. The interviews were focused mainly on the social side of the water systems and functions of *juntas de agua*. It did not put much focus on the physical situation of the water systems themselves and also not much about the sanitation side. The interview questionnaire, in Appendix, was designed as a semi-structured questionnaire. Most of the questions are open-ended questions designed not to restrict the content or manner of the reply (Robson, 1993). All interviews were recorded and transcribed. Data were analyzed into four categories: the condition of the water system; *juntas de agua*; land ownership and deforestation issues; and supports and needs. Data were also analyzed to discern the difference between communities that were in good condition and those that were not.

The main economic activity of the six communities is rain-fed agriculture; relying heavily on slash-and-burn techniques. Agua Friita and Santa Barbara are located very near the El Salvador border in a very dry area compared to the other

communities. In the dry season they cannot farm so they work in town or do other jobs like carpentry. Monte Vista and Nueva Vida are located in humid areas, but in a very remote area lacking road access. Quebracho and La Estanzuela are located near the town famous for the Maya ruins of Copán where a lot of tourists visit and is very close to Guatemala border. The land on which La Estanzuela is located is owned by a big landowner in the area and most of the people in the community work his land cultivating agricultural products or grazing cattle. In the other communities residents mainly farm although not always on land they own.

Table 4.2 Information on Interviewed Personnel

	Community	Number of people interviewed	Position in juntas de agua
1	Agua Friita	2	president (1) treasurer (1)
2	Santa Barbara	1	treasurer (1)
3	Monte Vista	4	president (1)* vice president (1)* secretary (1)* community member (1)
4	Nueva Vida	3	treasurer (1) community member (2)
5	Quebracho	1	president (1)
6	La Estanzuela	3	president (1) plumber (2)

* Position in Patronato

4.3 Interview Results

Water Systems

The number of the households receiving water from the water systems ranges from 29-90 houses (table 4.3). These numbers are not necessarily equal to the number of the total houses in the community since a few people in the community chose not to receive water and some communities send water to other communities. Since it was

not very clear from the interviews how many people live in these houses, the approximate number of people receiving water was calculated by multiplying average household size which is 5 (UN-HABITAT, 2009) by the number of the houses receiving water. The range is from 145-450 persons. Almost all of the households in the six communities have latrines that are obtained by donations.

Table 4.3 Water System Interview Results

	Agua Friita	Santa Barbara	Monte Vista	Nueva Vida	Quebracho	La Estanuela
Water system created	2006	before 1990	-	2002	1985	2006
Juntas de agua established	2004	1990	2001	2003	1985 (new one started in 2005)	2006 (as only this community)
No. of households receiving water	90 (20 in other community)	48	(24)	29 (3 communities)	68	36
Sponsor of the water system	Local politician	TEXACO, Japanese company (administered by Agua Para el Pueblo)	(Rotary Club)	SANAA, Univ. of New Mexico, HCSC	SANAA	Agua Para el Pueblo
Water source	groundwater	groundwater	(small stream)	small stream	2 small streams	small stream
Gravity fed or pumping	pumping	pumping	(gravity)	gravity	gravity	gravity
Latrine	Y	Y	Y	Y	Y	Y
Chlorinated	Y	Y	-	N	Y	Y
Water Availability throughout year	Y	Y	(Y)	Y	N	N
Interview participants's perceptions about water quality	excellent	good (check every 6 months)	-	good	bad (checked by Pure Water for the World)	good
Water use	domestic	domestic	-	domestic	domestic	domestic

Monte Vista has not yet built its water system, but they have already done the topographical survey and design and are awaiting funding from a Rotary Club in the U.S. The *junta de agua* is not working in Monte Vista since there is no water system yet, but the “Patronato”, the maximum authority of the village, is negotiating to get the

water system. The biggest reason Monte Vista wants a water system is for the elementary school. All the other communities have *juntas de agua* that were created mainly before or at the time the water systems were constructed. Sponsors of the water systems all came from outside the community in all six cases: local politicians, local and international companies, SANAA, NGOs, University of New Mexico, and Rotary Club. In addition, community people provided local materials and labor to construct the water systems.

Agua Friita and Santa Barbara are located in a region drier than the others and must pump groundwater since they cannot get enough water from the streams. All the other communities have gravityfed water systems in which water is diverted from small streams. However, Quebracho and La Estanzuela have hard times getting enough water at the end of the dry season because of a lack of water and also an undersized water tank that cannot distribute water to all of the household. In general, growing populations also pose problems for water supply. All six water systems allow the water to be used only for domestic purposes. Before the communities had water systems, they used to get water from small wells or walked long distance to get water from streams.

The quality of the water they are getting from the water systems is not always good. Agua Friita and Santa Barbara check water quality in regular basis, but other communities do not. Quebracho had its system's water quality tested by Pure Water for the World, an NGO, and discovered the water was polluted. Until then, the community members believed their water was good and safe, a very common belief in other communities. Pure Water for the World has introduced a bio-sand filter in each

household in Quebracho and the water is now potable (Casey, 2008; Pure Water for the World, 2009). Water is polluted because there are farms, livestock, and houses upstream from the water intake points.

Nueva Vida does not treat its water with chlorine even though they have the facility to do so. Some of the community members are opposed to paying for the cost of the chlorine since they are not receiving water from the tank they are going to put chlorine at, but from the same dam and do not going to benefit from it.

Water rights are not really structured in rural communities. Usually the people who own the land use the water which flows over the land or pump the water from underground. When communities want to use that water for the water system, they try to reach an agreement with the land owner to use the water and have the facilities on their land. However, some communities have problems getting permission to use the water on the private land. In Monte Vista the land owner is saying that if the community does not buy all the land surrounding the water source, he is not willing to let community have water.

After the completion of the water systems, community members have seen some changes in their life. One of the women in Santa Barbara said “When I was younger, we used to drink from any kind of pool of water on ground or stream and no one cared whether the bucket from the well was clean or not. But now, no one drinks from the stream or pool off the ground”. People in Nueva Vida said that they do not worry about getting water and take a bath almost every day, which they formerly could do once a week. However, they were not necessarily aware of the water quality issues.

Juntas de Agua

The number of the members of *juntas de agua* ranges from 5-8 people and they are the Board of Directors (table 4.4). Each member is elected in the Assembly, which is a general community gathering, usually every two years. All six communities have monthly or quarterly Assembly meetings, at which times tariffs are collected or people go to the treasurer's house to pay. The *juntas de agua* give information about the budget and expenses at this Assembly. Some *juntas de agua* educate the communities about not wasting water and how to handle it. The *juntas de agua* in Agua Fritia and Quebracho also hold monthly meetings and Santa Barbara and Monte Vista have meetings when needed. The meeting of a *junta de agua* is mainly a place to discuss problems, specify solutions and prepare financial and project reports to present at the Assembly.

Table 4.4 *Juntas de Agua* Interview Results

	Agua Friita	Santa Barbara	Monte Vista	Nueva Vida	Quebracho	La Estanzuela
Year of establishment	2004	1990	2001	2003	1985 (new one started in 2005)	2006 (as only this community)
No. of members	5	6	7	7	7	8
Frequency of meeting	Monthly	when needed	when needed	-	Monthly (on 9th of each month)	-
Frequency of assembly	once every 3 months	Monthly	(Monthly)	once every 3 months	Monthly (on 10th every month)	Monthly
Monthly tariff	100Lps (including 3Lps membership fee for AHJASA)	80 Lps (including 3Lps membership fee for AHJASA)	(20-30 Lps)	20 Lps	15 Lps (1 Lps for extra tap)	10 Lps
Plumber's salary	2300 Lps/m	800 Lps/m	-	300 Lps/m	70Lps for one day work/50Lps for small fixing	120 Lps/m
Collecting enough money to maintain the system?	N	N (they ask for extra when needed)	-	N	N	Y
How much is needed to maintain?	125	-	-	25-30	-	-
Fines assessed?	N	N	-	N	Y	N (planning to have one)
System connection fee	None	4,000Lps	None	2,700-3,000Lps	3,000Lps (in community) 5,000Lps (moving in to community)	None
Provide community education	Y (AHJASA)	Y (AHJASA)	N/needed	N/needed	Y (Pure Water for the World)	N

*1Lps = US\$0.05

The monthly tariff depends on what kind of systems the communities have. Since Agua Friita and Santa Barbara pump groundwater the tariff is very high to pay for the electricity. The other three communities collect tariffs range from 10–20 Lps per month and Monte Vista is planning to collect 20-30 Lps once they start providing the water. The community members pay the tariff by the time they are required to and if they cannot pay at that time, they usually pay it later. If they do not pay for few months, the *junta de agua* will tell them that they will cut off the water. However, none of the communities ever had that situation since most of the people will pay the tariff when they are warned.

None of the community members and members of juntas de agua whom I interviewed do not think the tariffs are too high. However, for some remote communities like Monte Vista, it is not easy to get cash even though the villagers can produce more than they can eat and want sell their products. A trip to town can take hours.

Funds are kept in a bank, if possible, to avoid stealing and demonstrate accountability. If the *juntas de agua* is not recognized as a legal entity (*personalidad juridica*), they have the bank account under their community name and two people will need to sign to withdraw money from the account.

Each *junta de agua* usually has one to two plumbers who have received technical training to do daily maintenance of the water systems. The plumber is generally the only person who gets paid. The monthly salary for the plumber ranges from 120-2,300 Lps. Quebracho provides money when something needs to be done. In addition, two people weekly check the system and clean the water tank which is a

mandatory task for all of the community members.

Nevertheless, the *juntas de agua* are not collecting enough funds to maintain the water systems except in La Estanzuela. One of the reasons funds are insufficient is that energy bills are going up rapidly (especially at the time of my visit, May 2008) for Agua Friita and Santa Barbara. Another reason is that water systems usually last for 20 years and they need to be rebuilt after that, but the *juntas de agua* are not been able to collect that much money to pay for the rebuilding of the water systems. Agua Friita and Santa Barbara have increased tariffs in the past, but the Assemblies must approve any increase and the members of *juntas de agua* know that such approval is not easy. In Santa Barbara, if there is an emergency need, the *junta de agua* ask the community and they respond.

All six communities do not have any rules for the water use other than restricting it to domestic use. There are no limits on how much water each house can use. Santa Barbara is contemplating the introduction of meters to record how much water each household uses, but the Assembly has not approved this. Quebracho charges 20 Lps for the people who do not attend the monthly meeting and 50 Lps for not checking and cleaning the water tank which every week two people from the community must do. They also charge 400 Lps for using water other than for human consumption.

If a new household wants to be connected to the water system, they need to pay a fee ranging from 2,700-5,000 Lps. Community members provide labor to construct the water system and in exchange, they get connected to the system without paying a fee. People do not provide labor or who are from outside the community

must pay a connection fee.

Santa Barbara is one of the 17 communities from which the AHJASA started in 1990. AHJASA is an organization gives support to *juntas de agua* by sending the Circuit Rider on a regular basis to member communities which was previously explained. Agua Friita started receiving support from AHJASA in 2006 and they are paying the membership fee each month which is 3 Lps per household. In exchange they are receiving some educational workshops and technical assistances. Agua Friita was going to receive a three day environmental seminar about watershed protection. AHJASA also received some requests from the communities when they need some external funding for projects like building water systems and latrines and try to bring in the funding sources to the communities. Quebracho also receives support from Pure Water for the World, an NGO, which introduced a bio-sand filter for each household. In addition they also give hygiene education to the community. The *junta de agua* in Quebracho started in 1985, but the members have not changed since that time and the tariff was not collected and the function of *juntas de agua* was collapsing. Therefore in 2005, Agua Para el Pueblo a Honduran NGO which has been designing and constructing water systems in all over the Honduras, helped them form a new *junta de agua* which is functioning right now.

Land Ownership and Related Issues

Land ownership in rural Honduras is unclear. Few people in the interviewed communities have legal title to the land. Problems occur when the water source areas are owned or occupied by private owners. A good example of this is Monte Vista. The

land from where the community wants to get water is privately owned (table 4.5) and the landowner wants the community to buy all the land around water source to access the water. He is asking 700,000 Lps for the land, relatively higher than the regular price for land in the area; the community is unable to pay. The community has contacted the NGO Honduras Community Support Corporation (HCSC), which was created by Nola White, a former Peace Corps volunteer in this area (HCSC, 2009).

Table 4.5 Land Ownership and Reforestation Issues

	Agua Friita	Santa Barbara	Monte Vista	Nueva Vida	Quebracho	La Estanzuela
Land title of water source	private	community	(private) negotiating to buy up the land - half by HCSC, and half looking for other fund source	Private, community (by HCSC)	No owner	Big land owner owns the entire land of the community
Land title of tank area	-	private (with agreement)	-	donated by the land owner	No owner	same as above
Problem with landowner	Y (build conscious to take care of the trees)	N	Y	Y	-	N (but problem with community next to them)
Reforestation project around water source	Y (Planning)	Y (2005-)	-	N (they already have forest)	N	N (they have tried to organize, but failed)

The HCSC has agreed to pay the half of the 700,000 Lps, but the community still needs to come up to pay for the other half to get the land. In Nueva Vida, HCSC has bought 8 *manzanas* (1 *manzana* = 1.72 acres) of the watershed to protect the water source and gave it to the community. The owner of the rest of the watershed has

agreed not to touch the land, which is forest right now. However, a problem could occur when he sells or otherwise disposes of the land and the new landowner does not follow the agreement.

In La Estanzuela, the situation was more severe. They used to have water system with six other communities twelve years ago, but they separated into two communities around 2004. At that time, the government gave the land for the water source to the both communities. However, the other community next to them bought the land around the watershed and basically cut off the pipe which was sending water to La Estanzuela even though the land was given to both of the communities. Fortunately, La Estanzuela could get help from the Agua Para el Pueblo to build a new water system, but they are not having enough quantity of water. Therefore, they need to get its new water source but funding for this task is problematic.

In Honduras, rapid rate of deforestation because of population pressure and expansion of agricultural and grazing land is also affecting the rural communities with erosion and water degradation (Batbier, 2001). The region around Agua Friita and Santa Barbara used to be forested but is now deforested and very dry. The community members of Agua Friita are trying to reforest the land around the water source; Santa Barbara planted trees in 2005 but most died. They are planning once again to plant trees. In Nueva Vida, the land around the water source is already a forest so they are just fencing it to protect the area.

There is some illegal logging occurring and people have seen some decrease in water quantity even in the region where Monte Vista and Nueva Vida are located. On the other hand, in Quebracho, the forest around the water source was burned by

someone and the community is thinking to reforest this area again. Someone from the outside approached La Estanzuela to bring in some trees to plant since the community realized that importance of reforestation, but they never got the trees.

In Honduras, the government has a plan to dedicate 1% of the national budget for forestation and military people were proposed to provide labor. However, most of the time these projects are not funded (Agua Para el Pueblo, 2008).

Supports and Needs

Even though it was decided to decentralize SANAA and introduce municipalization by the Framework Law and SANAA is supposed to be assisting the *juntas de agua* in the Regulation of the *Juntas de Agua*, there is no evidence that these six communities are receiving much support from either the municipalities or SANAA. All six communities answered that they are not getting any support from the municipalities and little support from SANAA, other than materials to build the water systems in Nueva Vida and Quebracho (Table 4.6). In addition, even though SANAA has signed a written agreement to visit Nueva Vida on a regular basis they have not done so at all. No support from municipalities and SANAA does not necessarily mean communities do not have any connection with them; however, it is common knowledge that the municipalities and SANAA do not have enough financial, human, and knowledge resources to provide support.

Table 4.6 Supports and Needs

	Agua Friita	Santa Barbara	Monte Vista	Nueva Vida	Quebracho	La Estanzuela
Support from Municipality	N	N	N	N	N	N
Support from SANAA	N	N	N	N (just for pipe)	N (just for building system)	N
Support from others	Local Politician , AHJASA	Agua Para el Pueblo, AHJASA	HCSC, FECOVESO , Alex del Cid, Rolando López, Rotary Club	HCSC, FECOVESO , Alex del Cid, Rolando López, Univ. of New Mexico	Agua Para el Pueblo, Pure Water for the World	Agua Para el Pueblo
Regular support to juntas de agua	Y (AHJASA)	Y (AHJASA)	N	N	N	N
Needs	-	-	Financial, Educational	Technical, Educational	Educational	Financial

On the other hand, all six communities receive support from several types of other organizations or individual people. Agua Friita and Santa Barbara are receiving regular support from AHJASA even after the completion of the water system. Monte Vista and Nueva Vida are getting support from Fundacion Eco Verde Sostenible (FECOVESO), a regional land trust and community development organization initiated through HCSC that is managing the forest land around the water source bought through HCSC (HCSC, 2008). Community members usually do not pay anything for HCSC to buy the property, but the land will be given to them after it is purchased from HCSC.

Alex del Cid is a local volunteer in Omoa region working through the Fundacion Desarrollo Sostenido (FUNDESO) who made the study of the topography

and designed the water systems in Monte Vista and Nueva Vida (Casey, 2005). Rolando López is also a volunteer working as a liaison between several parties working in the communities and who tries to bring in organizations which can help the communities in the Omoa region. In Nueva Vida, faculty and students from the Water Resources Program at the University of New Mexico came in as part of a field course to participate in the construction of water systems. However, both Monte Vista and Nueva Vida are not receiving regular visits from any organization to support the water system or the *junta de agua*. Even though the water system in Nueva Vida has a problem with high water pressure during heavy rains, they are unsure how to solve the problem. Quebracho and La Estanzuela are not receiving any regular visits or support for the water systems and *juntas de agua* other than for the water filtering system and hygiene education from Pure Water for the World in Quebracho.

Overall, Agua Friita and Santa Barbara are mostly satisfied with their situation other than the high energy prices. This satisfaction could be attributed to the regular support from AHJASA. However in the other four communities, there is no regular support from any of the organizations for *juntas de agua*. They are at least in need of either financial, technical or educational support.

Monte Vista needs financial support to buy the land to get water and they need education about watershed protection. In Nueva Vida they need technical support to fix the high water pressure. For educational support, they want to have more information about water quality and conservation, and maintenance of the water system and preservation of the forest. Quebracho seemed a little more satisfied with the situation than other three communities since they receive regular visits from Pure

Water for the World for hygiene education. However, they are still willing to get more support for watershed protection and even in general they think it will help the community members to have basic education. La Estanzuela needs financial support to build a new water system. However, the biggest problem is that they do not know whom to ask or where they can get support.

In addition, there are tendencies for these four *juntas de agua* to think they cannot really do much by themselves without any support from the outside. On the other hand, Agua Friita and Santa Barbara are more willing to solve problems by themselves as much as possible and they think that they should not depend on the funds from outside.

One other interesting result was that all the four communities prefer to get support or knowledge from the outside instead of inside. They think the community members will be more receptive if knowledge comes from the outside rather than from the inside. The wife of the treasurer in Nueva Vida said “People know the people here and even if my husband goes outside and learns more and comes back, people think ‘I know him from before and how can he know more than I do!’ But if the outsider comes, it is different because people do not know who he is and they will believe him”.

The results show there are significant difference between communities which get regular support and which do not. Communities getting regular support are confident about taking care of the water system by themselves. On the other hand, communities which do not get regular support are willing to get support from outside.

4.4 Summary

This chapter presented the results from the interviews conducted in six rural communities about *juntas de agua* and their water systems. The interviews were organized to assess the situation of water systems and *juntas de agua* in the rural communities.

Most of the water systems are not in critical condition, but in need of constant repair. Some communities also need to find a new water source since they are not getting enough water, especially in the dry season. *Juntas de agua* were mostly functioning, having regular meetings and collecting tariffs. However, they are not collecting enough for major repairs and future needs. Land ownership of the water sources and watersheds is one of the big problems the communities are facing.

In addition, none of the communities receives regular support from SANAA or municipalities, which shows no benefit of decentralization or municipalization. All communities have received some kind of support from local organization or NGOs from time to time, but most of this support is not on a regular basis. Communities receiving regular continues support are more satisfied with their situations and willing to support the *juntas de agua* by themselves as much as possible. On the other hand, the communities not receiving regular support do not know what to do or where to get the support. They are also not motivated to support themselves, but to rely on external support.

Chapter 5. Discussion and Recommendations

5.1 Introduction

There are several kinds of international organizations and NGOs that build water systems in rural communities. However, these groups generally leave communities shortly after completion of the projects and rarely return to give further support. This current approach does not foster sustainability and could be improved upon, but I believe national or local governments, because of their permanence, are the ones who should be responsible for giving support to the rural communities.

In this chapter, I will discuss the water and sanitation issues facing Honduras based on the results of interviews and literature review. I will then give recommendation how rural communities can improve their own situation and how national and municipal governments can support them.

5.2 Current Situation and Problems

Decentralization of the water and sanitation sector in Honduras was initiated in a top-down way (figure 5.1) from outside the country by the Inter-American Development Bank (IDB) (IDB, 1995). It resulted in several laws, regulations, and organizations designed to give more power to the municipal governments and rural communities so that they could provide their own water and sanitation services. However, reform of the sector is moving slowly and the benefits of decentralization have not yet reached rural communities.

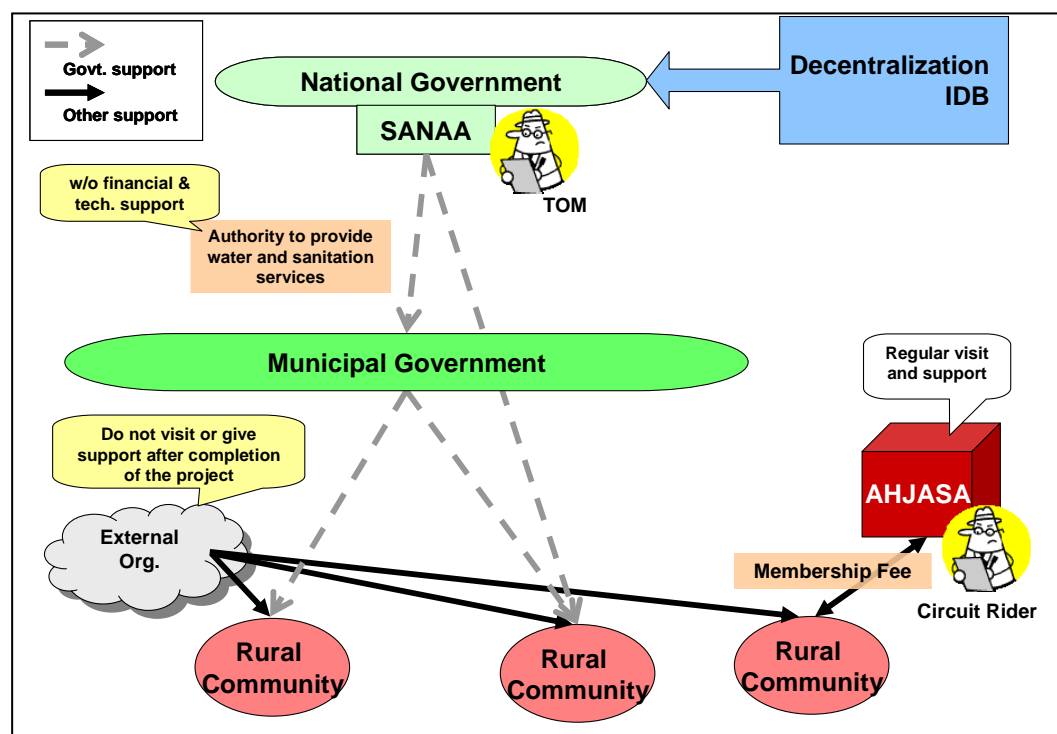


Figure 5.1 Flow Chart of Top-Down Decentralization

The National Autonomous Aqueduct and Drainage Service (SANAA) has still not transferred authority to municipalities to provide water and sanitation services. This was supposed to be done by 2008. Municipal governments have refused to accept this responsibility because of the lack of resources (Phumpiu, 2008; SANAA, 2008). SANAA still supports rural communities during the process of decentralization mainly by sending Operation and Maintenance Technicians (TOM), but since they have insufficient resources they have not been able to reach all of the rural communities.

In rural areas, the interviews show that even though the communities do not get any regular support from the government, some communities are in good shape because of support from the Honduran Association of Water System Committees (AHJASA). Communities that are not getting regular support lack financial, technical,

or educational support.

Regular support from other organizations is one of the critical factors that permits communities and their *juntas de agua* to maintain and operate their water systems sustainably. Rural communities have the basic ability to operate their water systems, but need consistent support. A framework to provide this support will be provided in the next section.

5.3 Recommendations

The easiest way for the *juntas de agua* to get regular support is to join AHJASA by paying the membership fee enough that would permit them to receive technical support. Right now, AHJASA has insufficient financial and human resources to support all of the *juntas de agua* in the country (AHJASA, 2008). Therefore, it is recommended for AHJASA to increase the membership fee so they can support more communities. It would be ideal for the government to give financial support to AHJASA, but this is unlikely because SANAA has not completed decentralization of their organization and it is hard to believe that they will give enough financial support and responsibility to AHJASA to work on behalf of them or municipal governments. There is not enough political will for this to happen (AHJASA, 2008).

Communities, especially the ones located in remote areas, need to cooperate with nearby communities and eventually create an AHJASA-like organization to provide regular support for *juntas de agua*. This organization will not be able to get and provide enough technical support for *juntas de agua*, but it could at least be able to exchange information, buy some spare parts, and help communities in emergency

situations. If AHJASA could be able to extend their organization in the future, the AHJASA-like organization can join the AHJASA or collaborate with them. This will help them increase the access to technical and educational support. It is also important for communities to lobby the government to provide financial support to AHJASA and NGOs could also support these movement.

The national government should also provide necessary support to municipal governments so they can support the communities and AHJASA-like organizations by sending people to promote community cooperation. Right now, SANAA is trying to send TOMs to reach all of the rural communities. However, there are not enough financial and human resources to cover all of the communities. Therefore, SANAA should educate the personnel in municipal governments to make them able to support their rural communities and AHJASA-like organizations. Municipalities can start by sending people to check the *juntas de agua* on a regular basis to ensure that they are functioning and collecting tariffs.

The national government should also create policy to promote community cooperation and make it easier for *juntas de agua* to be recognized as legal entities. It is also important for the national government to rectify the service gap between regions and maintain standards (e.g., water quality) throughout the country. The flowchart for these recommendations is shown in figure 5.2 below.

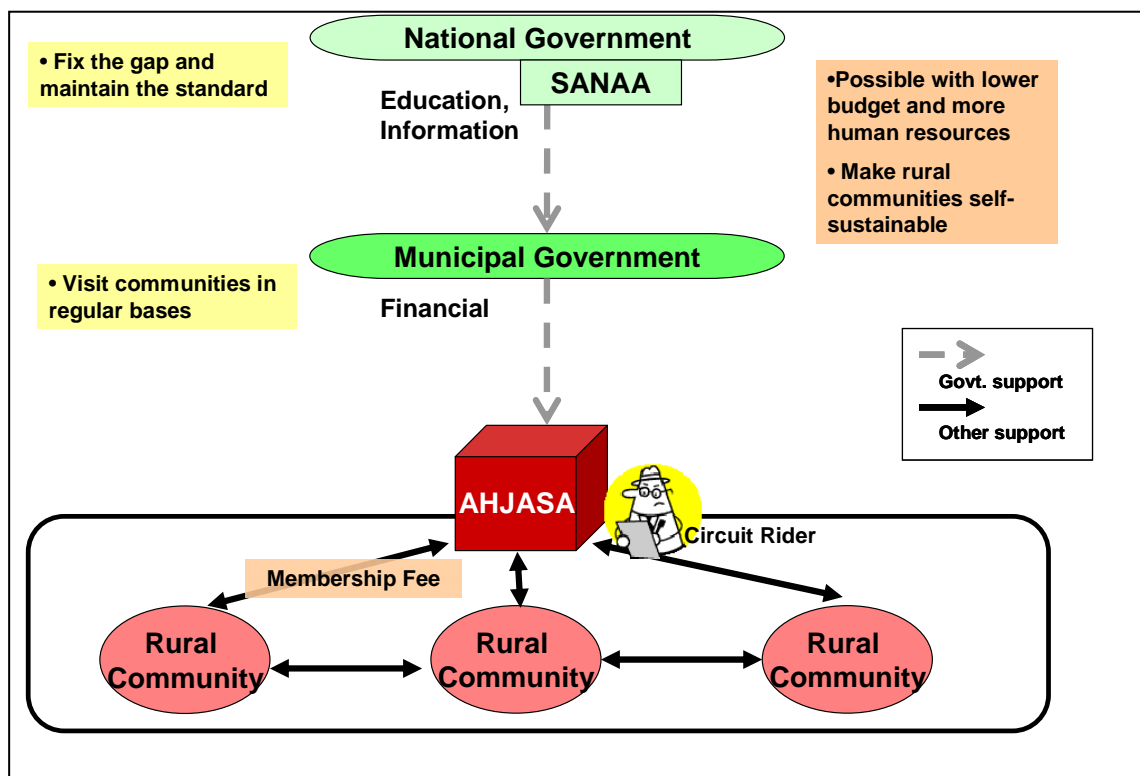


Figure 5.2 Flow Chart of Suggested Framework

5.4 Summary

Decentralization of the water and sanitation sector has been suggested to improve the water and sanitation sector, but since it was initiated in top-down way with lack of money, willingness, and human resources, decentralization has not fully reached rural communities. Therefore, it is more practical for rural communities to support themselves. Interviews suggest that regular support for *juntas de agua* is one of the most important aspects for the communities to maintain their own water systems. Communities should join the AHJASA by paying the membership fee or creating their own AHJASA-like organization if it is not possible for AHJASA to reach the communities. It would be ideal if AHJASA could reach all the communities,

but they lack financial and human resources. It is recommended for AHJASA to increase the membership fee and the government to give financial support to them.

At the same time, the national government should provide necessary support to municipal governments to support rural communities, instead of trying to reach them directly. It is also important that the national government create policy which will facilitate the community cooperation in rural areas and oversee the sector.

The recommended framework will improve the situation in rural areas despite the limited financial and human resources that Honduras has.

Chapter 6 Conclusions

6.1 Conclusions

Based on the results and the discussion, I conclude that there is a need for continuous regular support for the *juntas de agua* to sustainably manage and operate their water systems. Communities can get this support by joining the Honduran Association of Water System Committees (AHJASA), the organization giving support to *juntas de agua*, or creating their own AHJASA-like organization, especially in very remote areas. This will allow communities to get not only administrative support, but also technical and educational support through the Circuit Rider system. This is the most reliable and fastest way for them to get support for their water systems in rural areas.

This does not mean national or local governments do not need to support rural communities. The government should educate and train the personnel in municipal governments rather than trying to regulate and manage the water systems or water boards by themselves. The local government can also try to solve conflicts between communities by facilitating solutions.

It is also important to note that decentralization and privatization which is recommended by international organizations like the World Bank and IMF could have a down side which is to reduce the ability of the government to control the resources in the country as it is happening in Chile (The Patagonia Times, 2009). Therefore, it is necessary for the government to carefully discuss and decide what is going to benefit the communities and the country and not simply follow international organizations.

I will summarize the study by answering the four study questions and why I

came up with the conclusion I mentioned above:

1. What is the process of decentralization of the water and sanitation sectors in Honduras?
 - a. Decentralizations has been introduced in top-down way by international funding organizations.
 - b. Several laws, regulations, and organizations were created to implement the water and sanitation sector reform towards municipalization. This is still in process and will not be finished anytime soon.
 - c. The lack of financial and human resources, and willingness by government are the reasons for decentralization's slow implementation.
 - d. Legal recognition of the *juntas de agua* gave the authority to rural communities so they could legally operate and maintain their own water systems.

2. What kind of situations are rural communities facing and what are their needs for support?
 - a. People in the rural communities are willing to pay for the water and they have the basic ability to operate and manage the water systems.
 - b. Some communities receiving regular support from external organization like AHJASA are doing better than other communities and have been able to support themselves.
 - c. Most rural communities in the study need external assistance in the areas of the environment, administration, health, technical assistance, and finances.

3. Has the effect of decentralization reached the rural communities yet? Is there any evidence of improvement in this situation?
 - a. Rural communities have not received the benefits of decentralization.
 - b. Laws, regulations, and organizations created based on decentralization have not been effective enough to reach rural areas. This situation is not

likely to change soon.

4. Is there any way that rural communities can support themselves without governmental assistance?
 - a. Rural communities are in need of external support and government is the one who should be responsible for giving necessary assistance to them. It is not appropriate to rely on funding and assistance from overseas since it is not sustainable.
 - b. Rural communities should cooperate with each other to exchange knowledge and skills because it will take time for the government to fully reach rural areas. Ideally, the communities can join AHJASA or create organizations like AHJASA in each region.
 - c. Government should provide financial support to AHJASA to make them able to reach more communities, but this is not likely to happen without action from the communities and NGOs.

The main effort should be made by the communities but it will take time and a sustained effort to encourage government to work in favor of the rural communities. When both rural communities and the government work collaboratively, decentralization will benefit the nation.

6.2 Limitations

There are several limitations that need to be considered in this study. First, I have interviewed six communities in three different areas of Honduras, and recommendations are based on interviews with study participants in these communities. These participants' views and experiences may not be representative of

their communities. Furthermore, the case study communities chosen for this study may not be representative of all of rural Honduras.

Second, I focused my study on water supply and did not cover sanitation services. Yet this does not mean that sanitation is not important. Water and sanitation are many times discussed jointly and they are a very important aspect to improve people's health, especially in the rural areas for children (WHO, 1992; WHO/UNICEF, 2000). There are still not enough latrines in some of the communities or even if they have them, they cannot use them because of the lack of water. Sewage systems are almost nonexistent in rural areas of Honduras (ERSAPS, 2003). Sanitary education is also necessary; something as simple as hand washing with soap, which is very effective in preventing diarrhea (Curtis and Cairncross, 2003), is not widely practiced. I believe these services can also be improved by community cooperation and education assistance from government.

Third, watershed management and environmental protection are not covered in detail. Many rural communities have started reforestation to protect their micro-watershed, but topics covering water resources themselves and their management need to be covered. The agriculture and forestry sectors need to be addressed but are beyond the scope of this study. Nevertheless, community based management and cooperation will be a very important framework for addressing sanitation.

6.3 Recommendation to Funding Organizations

Aid from international organizations and NGOs has made enormous strides to implement water systems and to improve people's life in Honduras (ERSAPS, 2003).

However, there are two recommendations that I would like to give to these organizations so communities can become more self-sustainable.

- a. Empower the community members to work with other communities by building trust between them to be able to support each other.
- b. Encourage the government to support AHJASA by giving it financial aid and more responsibility.

6.4 Further Application

Community cooperation and community based management have been introduced to several sectors in developing countries, resulting in improvements (World Bank, 2009). Nevertheless, government support to promote and facilitate these actions are especially lacking in developing countries. Governments tend to protect their power and control instead of giving it to citizens, even if it is written in the law to pass the responsibility to local governments and communities. This disturbs communities who wish to manage their own property and resources. It is important to make the government understand the importance of community based management and lobby them to introduce policy and to promote community based management especially in the place where the government has not been able to reach rural communities.

At the same time, giving authority and responsibility to citizens to take care of their life and resources requires education and financial support. Yet this will be the most effective and efficient way for both rural communities and government to achieve their goals, not only in the water and sanitation sector, but also in many of the

rural development fields. These problems are not unique to Honduras or Central America, and the framework mentioned in Chapter 5 could be applied to other natural resources management and rural development fields.

BIBLIOGRAPHY

Agua Para el Pueblo. (2008). Personal Interview.

Atlas de Geográfico de Honduras (2007) *Atlas de Geográfico de Honduras*. Ediciones Ramsés.

Ballesteros, Maureen, Virginia Reyes, and Yamileth Astorga. (2007). Groundwater in Central America: Its Importance, Development and Use, with Particular Reference to Its Role in Irrigated Agriculture. In Giordano Mark and Karen.G. Villholth (Ed.). *The Agricultural Groundwater Revolution: Opportunities and Threats to Development*. CABI

Batbier, B. and Bergeron, G. (2001). Natural Resource management in the Hillsides of Honduras: Bioeconomic Modeling at the Microwatershed Level. International Food Policy Research Institute. Washington, D.C.

BBC News. (2009). Q & A Crisis in Honduras.
<http://news.bbc.co.uk/2/hi/americas/8124154.stm> (Accessed 7/30/2009)

Carlos Javier Rivera Garay. (2001). Metodología de Cobertura y Sostenibilidad en Agua y Saneamiento Rural. XXII Congreso de Centroamérica y Panamá de Ingeniería Sanitaria y Ambiental “Superación Sanitaria y Ambiental: El Reto”.

Casey, Charistine. (2005). Community Management for Improved Sustainability: Case Studies of Three Rural Community Water Supply and Sanitation Projects in Honduras. Professional Project Report submitted in partial fulfillment of the requirements for the degree of Master of Water Resources. University of New Mexico.

Casey, Charistine. (2008). Personal Interview.

Curtis, V and Cairncross, S. (2003). Effect of washing hands with soap on diarrhoea risk in the community: a systematic review. *The Lancet infectious diseases*, Vol.3 (5), 275-281.

ERSAPS. (2003). Análisis Sectorial de Agua Potable en Honduras.
<http://www.ersaps.gob.hn/NR/rdonlyres/E00C38FA-2351-4E4C-8223-17D19F379E42/722/AnalisisdelSectordeAguaPotable.pdf> (Accessed 1/15/2009)

FAO. AQUASTAT
<http://www.fao.org/nr/water/aquastat/main/index.stm> (Accessed 11/23/2008)

FAO. FAOSTAT.
<http://faostat.fao.org/> (Accessed 5/30/2009)

FAO/WHO. Water Law and Standards.

<http://www.waterlawandstandards.org/> (Accessed 3/20/2009)

Global Water Partnership (GWP)

<http://www.gwpforum.org/servlet/PSP?iNodeID=106> (Accessed 6/20/2009)

Honduran Water Platform (*Plataforma del Agua de Honduras*)

<http://www.undp.un.hn/plataformadelagua/> (Accessed 11/12/2007)

Honduras Community Support Corporation.

<http://www.hcsc-honduras.org/> (Accessed 4/05/2009)

IDB. (1995). Public Sector Reform Program.

<http://www.iadb.org/EXR/doc98/apr/ho967e.htm> (Accessed 3/18/2009)

IDB. (2008). Central America After Hurricane Mitch – The Challenge of Turning a Disaster into an Opportunity: Honduras.

http://www.iadb.org/regions/re2/consultative_group/backgrounder2.htm (Accessed 11/23/2008)

Merrill, Tim Merrill, ed. (1995). Honduras: A Country Study. Washington: GPO for the Library of Congress.

<http://countrystudies.us/honduras/> (Accessed 1/14/2009)

Ministry of Foreign Affairs of Japan (MOFA). Honduras - Countries and regional information

<http://www.mofa.go.jp/mofaj/area/honduras/index.html> (Accessed 11/12/2008)
(Japanese)

National Rural Water Association (NRWA).

<http://www.nrwa.org/> (Accessed 6/10/2009).

Oregon Association of Water Utilities (OAWU).

<http://www.oawu.net/> (Accessed 6/10/2009).

Peace Corps - Honduras. (2008). Personal Interview to Director of Water and Sanitation Projects in Honduras.

Phumpiu, Patricia. (2008). The Politics of Honduras Water Institutional Reform.

TRITA-LWR Report 3020. Royal Institute of Technology (KTH) Stockholm, Sweden

Phumpiu, Patricia, and Gustafsson, J.E. (2005). The Water Governance Reform in Honduras. In: Tsagarakis, K.P. (Ed.) Proceedings of the International Conference on Water Economics, Statistics and Finance, pp. 537-544. Rethymno, Greece: International Water Association, 8-10 July 2005.

Pranab Bardhan. (2002). Decentralization of Governance and Development. *Journal of Economic Perspectives*. Vol. 16 (4) 185-205.

Pure Water for the World, Copan, Honduras
<http://purewaterfortheworld.org/> (Accessed 04/14/2009)

Republic of Honduras. (1927). Ley de Aprovechamiento de Aguas Nacionales.

Republic of Honduras. (1990). Ley de Municipalidades, Decreto No. 134-1990.

Republic of Honduras. (1991). Código Salud, Decreto No. 65 de 1991.

Republic of Honduras. (2001). Poverty Reduction Strategy Paper: A Peoples' Commitment towards a Better Honduras. Honduras. IMF.

Republic of Honduras. (2003). Ley Macro del Sector Agua Portable y Saneamiento, Decreto No. 118-2003.

Republic of Honduras. (2006). Reglamento de Juntas Administradoras de Agua.

Republic of Honduras. (2007). Ley Forestal, Areas Protegidos y Vida Silvestre, Decreto No. 98-2007.

Robson, Colin. (1993). *Real World Research : A Resource for Social Scientists and Practitioner-Researchers*. Blackwell Publishers.

Rosensweig, Fred (ed). (2001). Case Studies on Decentralization of Water Supply and Sanitation Services in Latin America. EHP Strategic Paper No.1. USAID.

SANAA. (2008b). Personal Interview.

SANAA. (2008a). Modelo de Atencion en Agua y Saneamiento Rural. Power Point.

TFDD. International River Basin Registry.
<http://www.transboundarywaters.orst.edu/> (Accessed 1/14/2009)

The Patagonia Times. (2009). Pressure Builds to Renationalize Chile's Water.
<http://www.patagoniatimes.cl/index.php/20090520812/News/Environment/PRESSURE-BUILDS-TO-RENATIONALIZE-CHILES-WATER.html> (Accessed 7/31/2009)

Trevett, Andrew and Omar Nuñez. (1998). AHJASA – ongoing management and maintenance support for Honduras' community water systems. *Waterlines*. Vol. 16, No. 3, p. 24-26.

Trevett, Andrew. (2000). Institutional Arrangements for Rural Communities – The

SANAA Technician in Operation and Maintenance Program in Honduras. USAID.
http://www.ehproject.org/PDF/Strategic_Papers/LACDEC/Honduras_TOM.pdf

UN Human Settlements Programme (UN-HABITAT).
<http://ww2.unhabitat.org/habrdd/conditions/centamerica/honduras.htm>
 (Accessed 04/14/2009)

UNICEF.
<http://www.unicef.org/> (Accessed 4/24/2009)

USAID. About Honduras.
<http://www.usaid.gov/hn/strategy.htm> (Accessed 1/14/2009)

Wade, MichaelC. (2007). Evaluation of Deforestation in the Río Plátano Biosphere Reserve, Honduras. Research paper in partial fulfillment of the requirement for the degree of Master of Science. Oregon State University.

Water Governance Facility.
<http://www.watergovernance.org/> (Accessed 6/15/2009)

Williamson, John. (2000). What Should the World Bank Think about the Washington Consensus?. *The World Bank Research Observer*. vol. 15, no. 2, pp. 251-64.

World Bank. (2003) World Development Report 2004: Making services work for poor people. World Bank.

World Bank. (2008a). Governance Matters 2008 Worldwide Governance Indicators, 1996-2007 – Country Data Report for HONDURAS, 1996-2007.
<http://info.worldbank.org/governance/wgi/pdf/c98.pdf> (Accessed 6/15/2009)

World Bank. (2008b). Honduras at a glance.
http://devdata.worldbank.org/AAG/hnd_aag.pdf (Accessed 11/23/2008)

World Bank. (2009). Community-Based Rural Development: Introduction. World Bank.
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTARD/0,,contentMDK:21362950~pagePK:210058~piPK:210062~theSitePK:336682,00.html>
 (Accessed 8/12/09)

World Climate. <http://www.climate-charts.com/> (Accessed 1/14/2009)

WHO. (1992). A Guide to the Development of on-Site Sanitation. WHO.

WHO
<http://www.who.int/en/> (Accessed 6/20/2009)

WHO/UNICEF. (2000). Global Water Supply and Sanitation Assessment 2000 Report. WHO/UNICEF.

Zerbock, Olaf. (2005). Land Use and Water Quality in El Corpus, Choluteca, Honduras. Master thesis.

APPENDIX

Questionnaire for Water Board

Water Management Decentralization in Rural Honduras
Questionnaire for Water Board

QUESTIONNAIRE No.

Date: _____

Department: _____
 Community: _____

District: _____

Oregon State University
Water Resource Policy & Management
Yoshiko Sano

1. Water Board

Position: 1. President 3. Member
 2. Vice-president 4. other (_____)

How many members are on the Water Board? _____

When was the Water Board created? _____

What is the purpose/objective of the Water Board?

How was water managed before the Water Board?

How often is there a meeting? _____

How often do you attend the meeting? _____

Annual Budget: _____ Cost: _____

Who built the water supply system in the village? _____

When was the water supply system implemented? _____

How many households/people receive water? _____

How many households have a latrine? _____

How much is the fee to use water? _____

Do people pay enough to use the water? _____

Does this village receive any external support/budget? _____

What kinds of projects have been completed with external support/budget?

2. Water availability

2.1 In case of drought

Is there enough water throughout the year? _____

In case of drought, how does the village get water? _____

Does the village buy any water from a private provider? _____

If yes, how much does it cost? _____

2.2 Water use rule in the village

What kind of rule is there to use water?

Who enforces the rule? _____

How does the village protect the watershed supplying its water?

Are there any conflicts over land management in the watershed supplying the village's water?

2.3 In case of a breakdown in the water system

Who repairs it? _____

Where do you obtain supplies to repair the system? _____

Who pays for the supplies and repairs? _____

Are there enough supplies? _____

If yes: who provides support? _____

2.4 External Support

Does the village receive any support from SANAA or any other agencies for water supply? Yes / No

If yes: Who come to support? _____

How often do they come to the village? _____

What kind of support does the village receive?

What kind of Support does the Water Board need from the outside (SANAA, etc)?

2.5 Issues with other communities

Has this village had any problems/issues with upstream/downstream communities?

Quantity issue _____

Quality issue _____

Does this village negotiate over water with upstream/downstream communities?

Quantity issue _____

Quality issue _____

How are conflicts resolved?

3. Any comments about water supply and sanitation?
