Poverty and Sanitation

An analysis of the linkage between poverty and access to basic sanitation in Honduras

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Contents

Foreword

The struggle to eliminate poverty is an ongoing challenge for governments and international agencies worldwide. In Latin America, even though access to sanitation has improved in recent decades, much remains to be done. In 2004, some 125 million people, corresponding to 14% of the urban and 51% of rural dwellers, lacked access to improved sanitation systems. This not only adversely affects the health of the poorest, most vulnerable segment of the population; it also translates into economic losses, environmental damage and degradation of the quantity and quality of water resources, perpetuating a vicious circle of poverty and bad resource management.

To create global awareness of the sanitation crisis and the achievement of the sanitation targets of the Millennium Development Goals (MDGs), the United Nations has declared 2008 the International Year of Sanitation. Important political and technical events have been organized throughout the region to discuss sanitation and hygiene, to increase funding of sanitation programs, to create government commitments and to define concrete actions and strategic alliances. One key milestone in this process in the Latin American region was LATINOSAN, held in Cali, Colombia in November of 2007.

In Honduras, one of the key topics of the official Strategic Plan for Modernizing the Water and Sanitation Sector is political and administrative decentralization, under which a detailed plan for meeting the MDGs is a priority. This document was prepared with support from the World Bank Water and Sanitation Program to highlight the linkages between poverty and access to sanitation services. It shows that the poorest Hondurans, those living in dispersed rural communities and peri-urban slums, have the least access to appropriate sanitation technologies and coverage. The resulting high risks to the environment and family health are also identified.

It is hoped that the results of the present study will be useful to sector authorities in defining sanitation policies, strategies and technical assistance programs aimed at the poor, which can provide sustainable, high quality options adapted to local realities. To have a tangible positive impact on health, there is no doubt that these programs must also incorporate interventions in hygiene education and behavior change, such as hand washing.

We are thankful to Ricardo Mairena for preparing this document, as well as to WSP colleagues Rafael Vera, Nelson Medina, Martin Gauss, Marco Quiroga, Simón Zbinden and Oscar Castillo, for their review and suggestions. Our acknowledgements also extend to colleagues and members of RAS-HON, CONASA, SANAA and ERSAPS in Honduras, who provided valuable opinions during the sector workshop held in Tegucigalpa where this study was reviewed.

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This document presents an analysis of poverty levels among rural and urban households of Honduras and their access to sanitation solutions. It identifies key aspects for improving services and contributing to sector policies, strategies and investment plans that target the poor. The analysis is based on a broad review of available documentation and data.

This study shows that the low income population in Honduras is mainly rural (74%) and that the rest resides in urban areas (26%). The highest levels of access to sanitation services in cities corresponds to household connections to piped sewerage networks, but this option mainly serves the non-poor. Only 31% of the moderately poor and 12% in extreme poverty in urban areas have achieved access to sewerage networks. In rural areas sanitation solutions are generally on site excreta disposal (septic tanks or latrines) but only 70% of the moderately poor and 49% of those in extreme poverty have access to even these solutions.

This study identifies three scenarios for sanitation access:

a) **Urban areas**, where a significant part of the poor have latrines and a portion does not have access to even this solution. In this case, this study points out the need for a strategy to assure that existing on-site solutions function properly. In addition, improved water supply services are needed for poor sectors to be connected to sewerage networks.

b) **Concentrated rural communities** with populations above 200 people, where a high percentage of homes have latrines or other similar solutions. In this case, this study proposes rehabilitating or replacing dysfunctional infrastructure, and ensuring sanitary education and service sustainability.

c) **Dispersed rural villages** of less than 200 inhabitants with lower population densities are the poorest segment of the country and have the lowest

sanitation coverage. To increase effective sanitation coverage here, new intervention strategies and low-cost, environmentally-compatible solutions are needed. Finally, greater local participation is necessary to achieve effective and sustainable access to sanitation for these families.

The final conclusions of this analysis present the need to: a) prioritize pro-poor policies designed to facilitate their access to improved and sustainable sanitation services; b) adopt innovative, appropriate technologies and technical support; c) recognize the capacity of communities to organize and to contribute to their own development, by nurturing the participation of civil society organizations and strengthening them to fulfill their roles; d) create a system to monitor programs' performance; and e) involve the coordinated participation of NGOs and international agencies in developing sanitation programs.
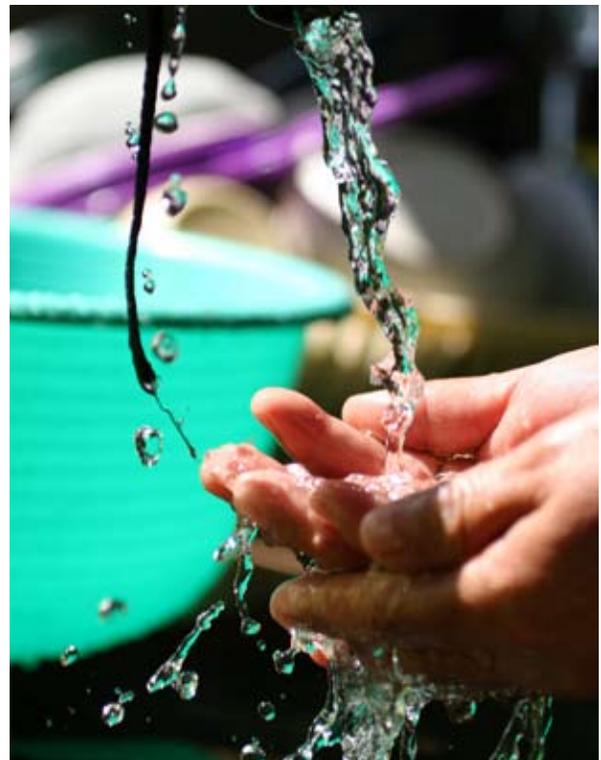
1. Introduction

Access to sanitation services is a basic indicator of poverty. If investments in the water and sanitation sector are to have a favorable impact on poverty reduction, they should target the poorest areas such as rural communities and peri-urban neighborhoods of larger cities. This study analyzes access to sanitation services (not including water supply services) as a function of the level of poverty.

In the global context, the Millennium Development Goals of the United Nations General Assembly (2000) and the results of the World Summit on Sustainable Development in Johannesburg (2002) set global targets that include reducing by half the percentage of people without sustainable access to safe drinking water and improved sanitation by 2015.[1] For Honduras, this commitment represents a challenge that implies a conscious, well-oriented effort that maximizes available opportunities and resources to ensure that poor and excluded families enjoy the benefits of sanitation in their health, improved living conditions and personal dignity.

The benefits of sanitation for people are direct and significant, but in order to improve sector performance, meet demands for quality services and achieve the proposed targets, the water and sanitation sector needs a major transformation, especially in its regulatory agencies, policies and strategies. These changes are already underway, stimulated by the new Water and Sanitation Sector Framework Law passed in 2003.

Providing the poor with sanitation services in the magnitude proposed in the Millennium Declaration requires an approach that takes into account the capacity of communities to organize themselves, contribute to their own development and meet local needs and demands. The poor should be at the center of planning and investment programs in sanitation. To this end, the agencies of the water and sanitation sector in Honduras are working together to develop new policy guidelines and sector strategies. However, there is little information available on sanitation in the country. To enrich this process of reflection and dialogue, the National Autonomous Water and Sewerage Service (SANAA) – acting as the Technical Secretary of the National Water and Sanitation Council (CONASA) – and the Water and Sanitation Network of Honduras (RAS-HON), with technical assistance from the World Bank's Water and Sanitation Program (WSP), analyzed the situation of sanitation in Honduras based on available official data.

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[1] United Nations Development Programme, UNDP. Web Page:
     Millennium Development Goals. http://www.undp.org/mdg/goallist.shtml

Objective of the study

The objective of the study was to analyze the situation of rural and urban sanitation in Honduras and its relationship to poverty. Sector institutions can use the findings of this study as a reference for developing sanitation policies and strategies that target the poorest Hondurans. Funding agencies and projects may also find this study useful in prioritizing their investments.

Methodology

The study is based on the following official information: i) Sector Programming based on the National Poverty Reduction Strategy (2005), published by CONASA using data from the 2001 National Census; ii) the 2004 Living Standards Measurement Survey (ENCOVI)[2], and; iii) the 2006 Multi-Purpose Permanent Household Survey (EPHPM)[3].

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[2] The ENCOVI of the National Statistics Institute (INE) is a multi-purpose survey carried out every four or five years on household living standards. The sample is 8,064 households in 688 urban and 320 rural areas grouped in 1,008 census strata.

[3] The EHPM is multi-purpose survey carried out twice annually by the INE. The 2006 survey covered a sample of 20,955 households in 2,334 urban and 1,857 rural areas, distributed in 4,191 census strata.

2. Access to sanitation and the situation at the national level

Table 1 shows percentages of access to sanitation services according to the three data sources.
It should be noted that the data on access correspond to different years and is based on different calculations. In the case of the CONASA document, access was determined using population data. The ENCOVI and EPHPM surveys refer to the percentage of homes with access to water and sanitation services.

The data from this table should be used considering that the levels of access to sanitation described are based on different sources using different calculation methods. Whereas the levels of access to water supplies are similar, there is a significant difference between the percentage of access to sanitation reported by CONASA and that reported by ENCOVI and EPHPM. This is because CONASA estimates coverage of sanitation services excluding urban households with access to on-site excreta disposal solutions (latrines and septic tanks); CONASA only considers as having access to sanitation the population connected to a sewerage network. If this indicator were applied to the data reported by ENCOVI in 2004, sanitation coverage nationally would have been 64%, comparable to the level reported by CONASA.[4]

Table 1
Access to water and sanitation services in Honduras

Type of Access	CONASA 2005	ENCOVI 2004	EPHPM 2006
	Population (1)	Households (2)	Households (3)
Water	79.5%	80.1%	81.0%
Sanitation	67.1%	82.2%	85.6%

(1) CONASA. Sector Programming based on Targets of the Poverty Reduction Strategy
    January 2005. 2001 Census data.
(2) National Institute of Statistics (INE). Survey of Living Conditions 2004.
(3) National Institute of Statistics (INE). Multi-purpose Permanent Household Survey 2006.

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4 The percentage of households with access to sanitation is calculated with 2004 ENCOVI data takes the total number of rural households with a sanitation solution (474,964), adds
   435,754 urban households connected to a sewerage network, divided by the total number of households (1,417,071), resulting in 64.3% with access to sanitation.

The data as reported here indicate that access levels were comparable. Nevertheless, for the purpose of analyzing the state of sanitation, this study uses the 2004 ENCOVI figures, as that survey was also used as the basis for a recent poverty study by the World Bank published in 2006.[5]

The 2004 ENCOVI survey estimated a total national population of 7.07 million, of which 51.7% lived in rural areas and 48.3% in cities.

The recent poverty assessment of Honduras established poverty strata for the population and reported that 50.7% of the population (3.58 million) lived below the poverty line and 23.7% (1.68 million) lived in extreme poverty. These figures indicate that more than five of every ten Hondurans live in poverty and that more than two of every ten live in extreme poverty conditions.

On the other hand, several sanitation technologies are in use in the country, including on-site excreta disposal (latrines and septic tanks) and hydraulic sewerage networks. Table 2 uses 2004 ENCOVI data to determine access to sanitation services by technology.

Table 2 Access to sanitation by technology		
Sanitation solution	Percentage of households with access	Total percentage
Sewerage network	32.3%	82.2%
On-site hydraulic systems	11.7%	
Latrines	38.2%	
No access	17.8%	17.8%
	100%	100%

Source: 2004 ENCOVI

5 Honduras: Poverty Assessment. Attaining Poverty Reduction. World Bank, June 2006.

While approximately one-third of all households had access to a sewerage network, the latrine[6] was the most common option, found in 38% of households. When on-site hydraulic systems (12% of households) were included,[7] on-site technologies were found in half (50%) of households surveyed in both rural and urban areas.

As this document will show, access levels, type of sanitation technology and socioeconomic levels are all related. This study uses the poverty classification system employed in the World Bank's poverty assessment[8], which designates three categories: a) the non-poor; b) the moderately poor; and c) the extremely poor.

Table 3 shows the level of access to the different types of sanitation technology for each socioeconomic group.

Table 3
Sanitation access by poverty groups
(Percentage of poverty group for each category)

Type of sanitation service	Non-poor	Moderately poor	Extremely poor	Total
Connection to a sewerage network	51.0	12.4	2.2	32.2
On-site hydraulic system (1)	15.6	8.6	3.9	11.6
Latrine (2)	26.7	55.0	49.4	38.2
No access	6.7	24.0	44.5	18.0

Source: Honduras Poverty Assessment. World Bank, June 2006
(1) Includes: a) bathroom connected to septic tank; b) bathroom discharging to a river/stream; c) toilet discharging to a river/stream
(2) Includes: a) pour-flush latrine; b) latrine and septic tank; c) pit latrine; d) composting latrine

[6] For this study, "latrine" refers to all safe human waste disposal solutions near the dwelling, including pour-flush (water seal) latrines.
[7] On-site solutions with pour-flush latrines included systems with septic tanks, as well as small-bore piped connections that discharged untreated waste into rivers, streams, etc.
[8] Honduras: Poverty Assessment. Attaining Poverty Reduction. World Bank, June 2006.
[9] "The extreme poverty line is defined as the monthly cost of food to provide 2,200 calories per day …The full poverty line is equal to the extreme poverty line plus an additional allowance for non-food consumption." Honduras. Poverty Assessment. World Bank, June 2006.

Graph 1
Sanitation access - non poor

Percentage of households in poverty group

Sewerage — 50.0+

On site hydraulic systems — ~15

Latrines — ~27

No access — ~6

Sanitation technology

Graph 2
Sanitation access – extremely poor

Percentage of households in poverty group

Latrines — ~49

No access — ~44

Sewerage. — ~2

On site hydraulic systems — ~4

Sanitation technology

Graph 3
Sanitation access - moderately poor

Group percentage of households

Latrines — ~55

Not defined — ~25

Sewerage — ~13

On site hydraulic systems — ~9

Sanitation technology

The table shows that more than half (51%) of non-poor households were connected to a sewerage network, corresponding to homes in areas where a physical connection was possible. The 2004 ENCOVI survey showed that higher-income groups were the ones most often connected to sewerage networks. Sewerage connections of the lowest two income quintiles of the population represented 11% of all connections, whereas the two highest-earning quintiles accounted for 70% of all connections.[10]

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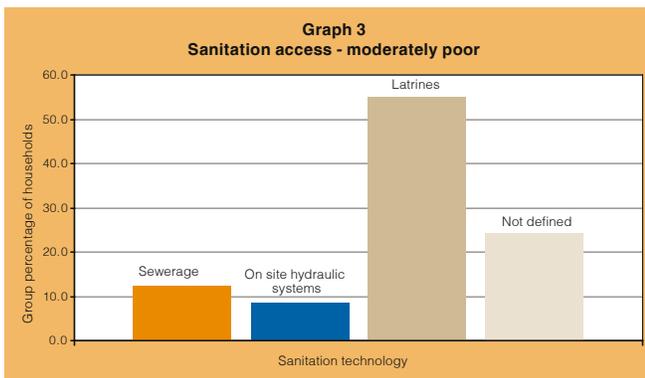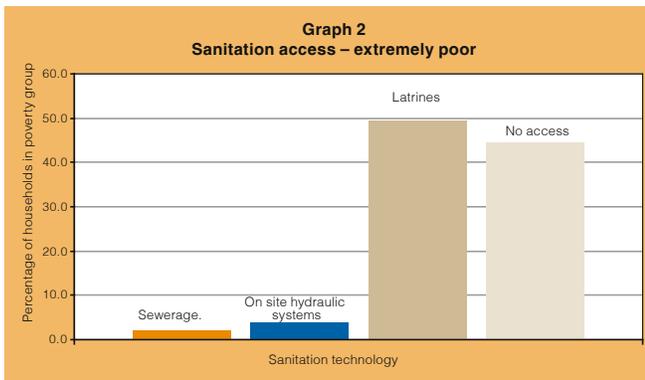
[10] ENCOVI 2004. Table 12, page 50.

A small percentage of non-poor households had latrines and on-site hydraulic solutions (septic tanks). Where these households are located in areas without sewerage networks, on-site solutions (latrines and septic tanks) are the only feasible option. This situation occurs in non-poor urban households located far from the sewerage networks and in non-poor households in rural areas.

In the moderately poor group, latrines were the most frequently installed technology; connections to sewerage networks and on-site hydraulic solutions were much less frequent, largely because this population is concentrated in rural zones where the latrine is the most frequently chosen sanitation technology (62.8% of the moderately poor live in rural areas). A smaller percentage of this group lives in peri-urban zones without access to sewerage networks. In these zones, latrines are the "temporary" sanitation solution most frequently adopted.

The extremely poor group relies almost exclusively on latrines. The latrine has the lowest cost of the sanitation technologies in use the country. However, this group's poverty limits its ability to cover the cost of a latrine. Consequently, 44.5% of the extremely poor (747,000 people) did not have access to any form of sanitation.

These figures refer to aggregate national totals. The following sections present a more detailed analysis of sanitation access in rural and urban areas.
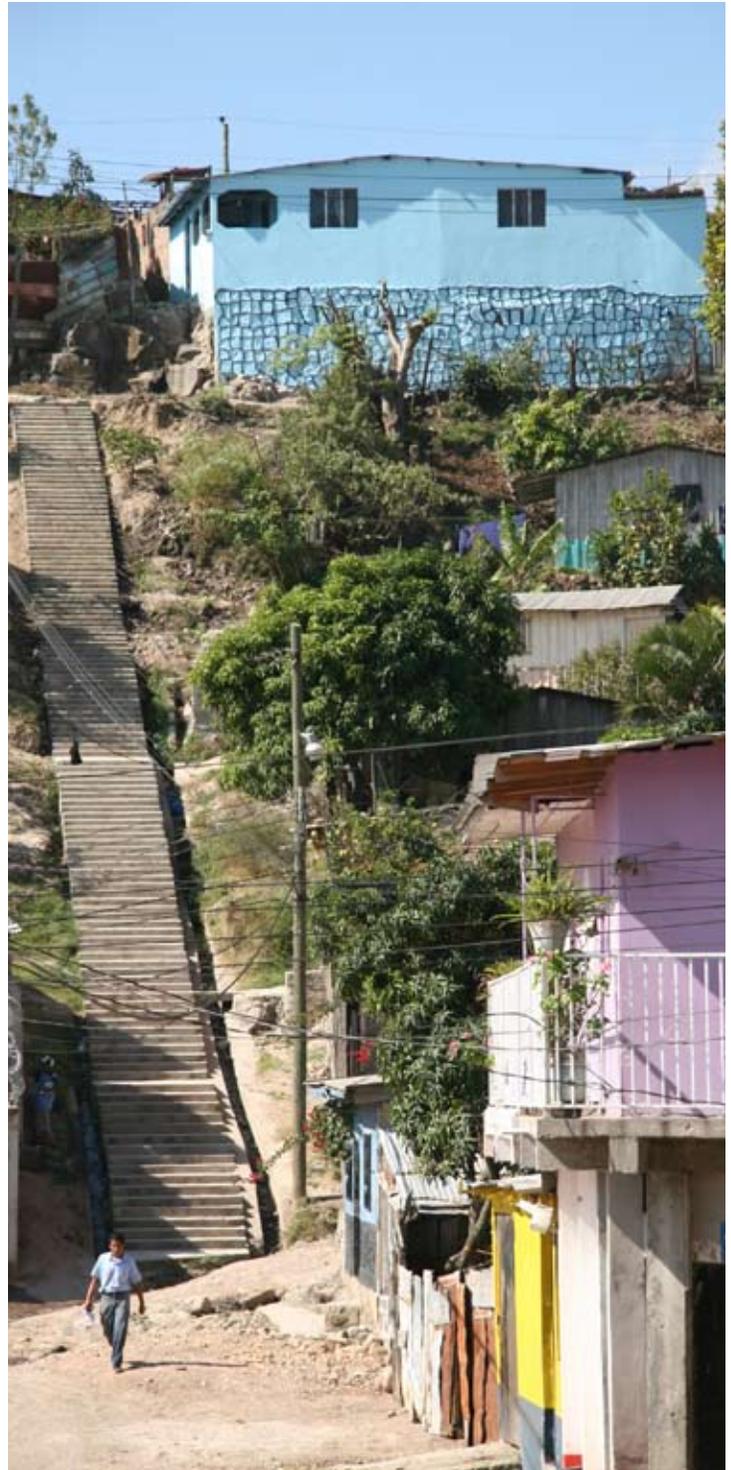
3. Rural sanitation

The rural areas of Honduras have a greater incidence of poverty. According to the World Bank poverty report,[11] 72.2% of the rural population lived below the poverty line and represented 73.7% of the country's poor (2.64 million). 39.5% of the rural population was extremely poor, accounting for 86.1% of the total population living in extreme poverty (1.44 million), which means that more than seven of every 10 people living in rural areas were poor and that of those, almost four lived in extreme poverty.

These figures are values averaged for rural areas nationwide, but some regions have even higher poverty levels. The rural area of the country's central region had 30.6% of the nation's poor (1.10 million), followed by the western rural areas with 26.9% (960,000) and eastern rural areas with 16.3% (580,000).

Table 4 shows percentages with access to sanitation in rural areas. Latrines were the most commonly used rural sanitation technology - more than half of all households (53.2%) had latrines. On-site hydraulic systems, mainly septic tanks, were the second-most common option (12.2%). These two technologies represented the sanitation solution for nearly two-thirds of rural households. The remaining third of rural households

(31.4%) apparently had no access, representing an estimated 1.1 million rural inhabitants with no safe sanitation.[12]

Sanitation network connections were almost insignificant in rural areas, serving only 3.2% of rural households.

Graph 4
Distribution of poverty by region

Eastern rural 16.3%

Total urban 26.2%

Western rural 26.9%

Central rural 30.6%

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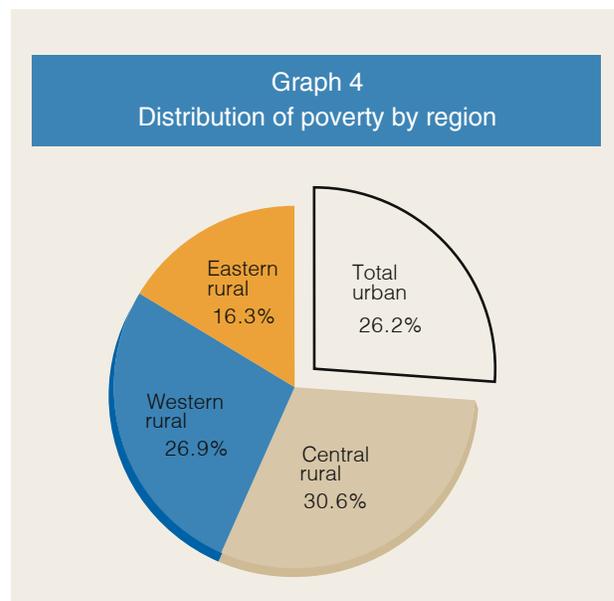
[11] Honduras: Poverty Assessment. Attaining Poverty Reduction. World Bank, June 2006.
[12] Population is determined to be 31.4% of 689,932 rural households with an average occupation index of 5.2 inhabitants per dwelling, as reported by ENCOVI 2004.

Data and classification of the 2004 ENCOVI in Table 4 show that on-site hydraulic solutions included: a) bathroom with a septic tank (94%); b) bathroom discharging to a river/stream (3.8%); and c) toilet discharging to a river/stream (1.8%). Many non-poor households in towns and ranches that can afford infrastructure costs have bathrooms with septic tanks.

Table 4 Access to rural sanitation by poverty groups (Percentage of households for each category)				
Type of Sanitation Service	**Non-poor**	**Moderately poor**	**Extremely poor**	**Total**
Connection to sewerage network	7.1	1.7	0.3	3.2
On-site hydraulic system (1)	25.0	7.5	1.8	12.2
Latrines (2)	51.3	59.7	48.8	53.2
No access	16.6	31.1	49.1	31.4

Source: Honduras Poverty Assessment. World Bank, June 2006
(1) Includes: a) bathroom connected to septic tank; b) bathroom discharging to a river/stream; c) toilet discharging to a river/stream
(2) Includes: a) pour-flush latrine; b) latrine and septic tank; c) pit latrine; d) composting latrine

Latrines are present in both poor and non-poor groups. Latrines for each group were as follows: 51% in the non-poor group, 60% in the moderately poor group and 49% in the extremely poor group. Latrines are most common in rural households, especially among the poor, because government institutions, mostly the Honduran Social Investment Fund (FHIS), and non-governmental organizations, provide these through their rural infrastructure programs.

Several types of latrines have been built in rural areas. The INE uses the following classifications in its surveys: a) pour-flush latrines; b) latrines connected to a septic tank; c) pit latrine;[13] and d) composting latrines. Data from ENCOVI 2004 allowed to calculate the prevalence of each of these types of latrines for rural sanitation. Table 5 lists percentages of rural households with each type.

Pour flush latrines were the most common type of latrine in rural areas (54%). Pit latrines ranked second, accounting for approximately one-third of all latrines. These two groups were the most frequent, together accounting for 84% of all latrines in rural households.

Table 5 Latrines in rural areas		
Type of latrine	**Percentage of total rural latrines**	**Percentage of total rural households**
Pour-flush latrine	53.8%	28.7%
Septic tank latrine	15.7%	8.4%
Pit latrine	29.9%	15.9%
Composting latrine	0.6%	0.3%
Total	100.0%	53.3%

* Based on 2004 ENCOVI data

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[13] Including the simple pit latrine and the ventilated improved pit latrine.

Composting latrines were uncommon, present in only 0.3% of rural homes. This technology is isolated and innovative in Honduras. More promotion, stimulation of demand, training and a stronger integrated approach (as ecological sanitation, for example) are needed.

Data on access to sanitation are a good indicator of the existence of infrastructure in general. However, there is little information in the sector on the state of existing sanitation infrastructure, its maintenance and use and the sanitary practices of the rural population. A recent WSP study on the current situation of sanitation services in 25 rural communities in 13 of the country's 18 departments found that 91% of the surveyed latrines were in good condition; these latrines were built after Hurricane Mitch.[14]

An estimated 31% of households did not have any excreta disposal solution. At the same time, the real levels of latrine usage are unknown. There is insufficient data available on the population that does not use latrines and the reasons for disuse (habits, preferences, poor physical condition, lack of resources for building or repairs, etc.). This suggests that simply counting latrines may result in an overestimate of the real access to sanitation in rural zones. Studies are needed on the condition and use of rural sanitation infrastructure and on personal sanitary habits. To this end, the periodic National Statistics Institute (INE) household surveys could be modified to collect information to help assess these indicators nationwide.

In recent years, interventions by the Honduran government, NGOs and international agencies have incorporated capacity-building to encourage active community and family participation to help ensure sustainable services. Local capacity-building activities include hygiene education for behavior modification, using a methodology developed by UNICEF and SANAA since 1996. The Healthy School and Home methodology has served as a model for public and private organizations working in the sector.[15]

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[14] Assessment of the Current Situation of Basic Sanitation Services in Rural Communities and Low-income Urban Areas of Honduras. NJS Consultants Co., Ltd. World Bank Water and Sanitation Program, November, 2005.
[15] Field Note: Healthy Home and School - A Successful Experience in Honduras. Anthony P. Brand. World Bank Water and Sanitation Program, September, 2003.

4. Urban sanitation

The INE defines urban areas as communities with a population of more than 2,000 and with basic public services (water, electricity, health centers, etc.).[16] Under these criteria, 48.3% of the national population is urban. The country's largest cities are Tegucigalpa (population 885,000) and San Pedro Sula (population 543,000). These two cities alone represented 41.8% of the urban population and 20.2% of the total population. An additional two million people lived in other urban centers.[17]

Table 6 Urban population (thousands)			
	Population	Percentage of urban total	Percentage of national total
Tegucigalpa	885	25.9%	12.5%
San Pedro Sula	543	15.9%	7.7%
Rest of urban	1,985	58.2%	28.1%
Total Urban	3,413	100.0%	48.3%
National Total	3,413	100.0%	48.3%

Source: 2004 ENCOVI

A total of 3.4 million people lived in urban areas, of which 20.8% (710,000) were moderately poor, 6.8% (230,000) extremely poor and 72.2% (2.5 million) non-poor.

These figures show that nationwide, urban areas were home to just over a quarter (26.3%) of the country's poor, 13.9% of the total extremely poor and 70.9% of the total non-poor. In general, urban dwellers can be expected to have a greater capacity to pay for water and sanitation services than do rural households.[18]

Table 7 Urban population by poverty status (City/group – calculated by row)				
	Extremely poor (1)	Moderately and extremely Poor (2)	Non-poor (3)	Total (2)+(3)
Tegucigalpa	1.9%	15.1%	84.9%	100.0%
San Pedro Sula	1.4%	16.6%	83.4%	100.0%
Rest of urban area	10.5%	36.2%	63.8%	100.0%
Total Urban	6.8%	27.6%	72.4%	100.0%

(% of national total – calculated by column)				
	Extremely poor	Moderately and extremely poor	Non-poor	Total Population
Tegucigalpa	1.0%	3.7%	21.5%	12.5%
San Pedro Sula	0.4%	2.5%	13.0%	7.7%
Rest of urban	12.5%	20.0%	36.3%	28.1%
Total Urban	13.9%	26.3%	70.9%	48.3%

Source: Honduras: Poverty Assessment. 2006, World Bank.

Table 8 presents access to sanitation in the country's urban areas. Sewerage networks served 60% of households, a low coverage rate for cities. It is noteworthy that more than a third of households had on-site sanitation solutions (septic tanks and latrines), a reflection of the insufficient expansion of sewerage networks to meet the growing urban demand.

Just 5.2% of urban households had no access to any type of sanitation, but that small percentage represented 37,800 urban households, suggesting that outdoor defecation may be widespread. This practice creates contamination problems in dense peri-urban areas, where the poor and especially the extremely poor live, and where many households lacked access to sanitation (28%).

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[16] 2004 National Living Standards Survey. INE, pg. 17.
[17] Ibid.
[18] Honduras: Poverty Assessment. Attaining Poverty Reduction. World Bank, June 2006.

The sanitation technology to which urban residents have access varies according to their poverty level. Among the non-poor population (72.4% of urban dwellers), 70% of households were connected to a sewerage network. The second most common type of sanitation among the non-poor was on-site human waste disposal (septic tanks and latrines). On-site technologies were used in 28.2% of urban households, which resort to these solutions because they cannot connect to the sewerage network, usually due to the low capacity of piped networks or the distance to city collection networks.

Table 8
Access to urban sanitation by poverty group
(Percentage of households for each category)

Type of Sanitation Service	Non-poor	Moderately poor	Extremely poor	Total
Connection to a sewerage network	69.5	31.5	12.2	60.0
On-site hydraulic system (1)	11.7	10.4	6.1	11.2
Latrines (2)	16.5	46.6	53.4	23.6
No access	2.3	11.5	28.1	5.2

Source: Honduras: Poverty Assessment. World Bank, June 2006
(1) Includes: a) bathroom connected to septic tank; b) bathroom discharging to a river/stream; c) toilet discharging to a river/stream
(2) Includes: a) pour-flush latrine; b) latrine and septic tank; c) pit latrine; d) composting latrine


Graph 5
Sanitation Access – Non Poor

Graph 6
Sanitation Access – Moderately Poor

Graph 7
Sanitation Access – Extremely poor

Graph 8
Sanitation Access - Total
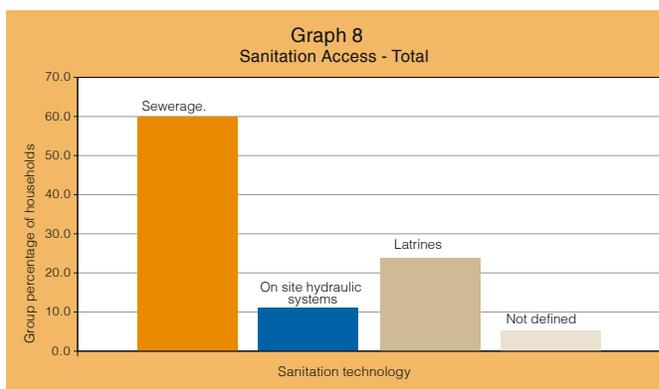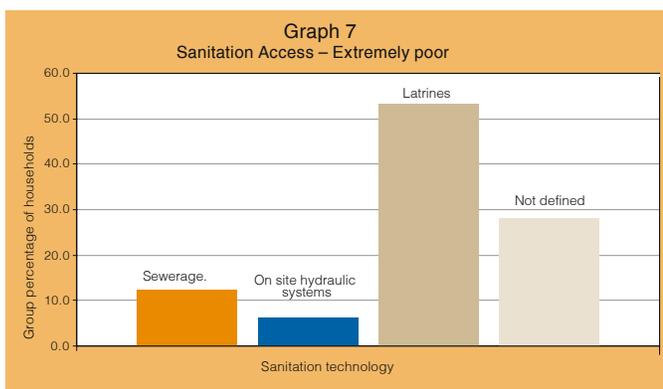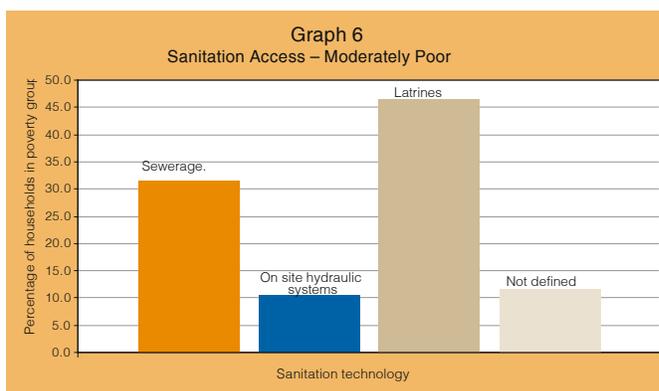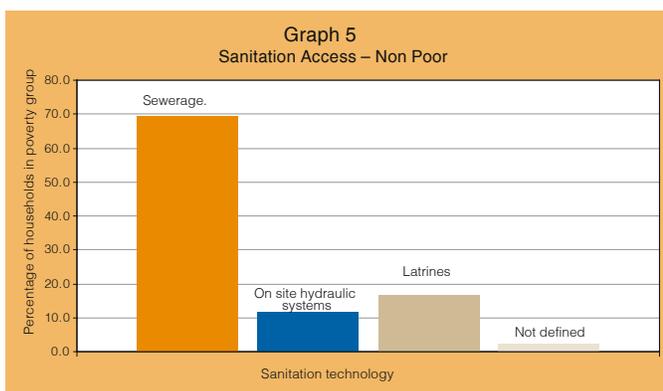
Table 9
Latrines in urban areas

Type of latrine	Percentage of total urban latrines by type	Percentage of total urban households
Pour-flush latrine	32.3%	7.7%
Septic tank latrine	23.9%	5.7%
Pit latrine	42.9%	10.2%
Composting latrine	0.9%	0.2%
Total	100.0%	23.7%

Source: 2004 ENCOVI

Network connections were drastically reduced to 31.5% in the moderately poor group (20.6% of the urban population), in which the relative percentage of households with latrines was almost triple, at 46.6%. These figures indicate that whereas approximately one third of the population was connected to the sewerage network, most people lived in homes too far from the piped networks or did not have the economic capacity to connect to them. Most of them did have latrines, however, paid for with donations or with their own resources.

Among extremely poor households (6.8% of the urban population), latrine access rose to 53.4%. However, the percentage of extremely poor households without any access to sanitation increased significantly to 28.1%. These families live in peri-urban areas, often with difficult access and high risk. Latrines in extremely poor households are most often built with support from social investment programs.

In urban areas, most on-site hydraulic systems listed in Table 8, according to the INE classification system, are bathrooms (toilets and/or showers and/or washstands) connected to septic tanks, and households that discharge wastewater into rivers/streams. Of the urban families (poor and non-poor) with these systems, 82.3% had septic tanks and 12.3% discharged wastewater into streams.[19]

Latrines also represent an important sanitation solution in the urban environment. Nearly one quarter (23.6%) of urban households in Honduras had one of several types of latrines. Table 9 lists the principal types of latrines found and the percentage of the total households with latrines. Pit latrines (both simple and improved ventilated pit latrines) were the most common in urban areas, representing 42.9% of all latrines, and were present in 10.2% of urban households. Pour-flush latrines and septic tank latrines together accounted for 56.2% of households with latrines.

Pour-flush latrines and pit latrines discharge wastewater into the subsoil for infiltration. To be effective they must be built on soil with adequate permeability to permit the wastewater to seep downward, away from people and reducing possible transmission of pathogens. When these latrines are built on permeable soil they can greatly improve sanitary conditions. However, where subsoil has limited permeability, where it is rocky, where the water table is high or where plots are steeply sloped, this type of latrine can generate contamination. In these cases, wastewater can accumulate in subsoils and leak into topsoils, potentially contaminating the environment and putting public health at risk.

[19] Honduras: Poverty Assessment. Attaining Poverty Reduction. Pg. 138. World Bank, June 2006.

Table 10
Sanitation access in Tegucigalpa
(Percentage of dwellings in each category)

Type of sanitation service	Total
Connection to sewerage network	80.7
On-site hydraulic system (1)	3.6
Latrines (2)	12.6
No access	2.8

Source: Honduras: Poverty Assessment. World Bank, June 2006
(1) Includes: a) bathroom connected to septic tank; b) bathroom discharging to a river/stream; c) toilet discharging to a river/stream
(2) Includes: a) pour-flush latrine; b) latrine and septic tank; c) pit latrine; d) composting latrine

Technical standards should establish the acceptable conditions for applying this technology. In Honduras there are legal and normative gaps on this issue, and technical standards should be prepared and implemented for the selection, design, construction, operation and maintenance of on-site systems in urban areas.

Access to sanitation services in Tegucigalpa

According to ENCOVI data from 2004, 80.7% of households in the capital were connected to the sewerage network. Latrines were the second most common sanitation technology found, serving 12.6% of homes. On-site hydraulic systems were found in 3.6% of dwellings. A total of 2.8% of households reportedly had no sanitation solution.

Despite the high percentage of access to the sewerage network reported by ENCOVI, many sectors of the network of sub-collectors, collectors and interceptors were damaged in 1998 by Hurricane Mitch. To date, only a small part of the network has been repaired. Wastewater collected by the sewerage networks is discharged into rivers and streams.[20] This situation is particularly evident near bodies of water, such as the Chiquito and Choluteca Rivers.

Another complication of the city's sewerage system is its age; part of the network is over 50 years old and badly needs rehabilitation or replacement. However, the real condition of many of the city's collectors and much of it's collector network is unknown.[21] Further studies are needed to determine which sectors of the network require the most urgent repairs or replacement and the real capacity of the primary collection system (sub-collectors and collectors).

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[20] Interviews with personnel of the National Autonomous Water and Sewerage System (SANAA).
[21] Interviews with SANAA personnel.

For the present study, Tegucigalpa was analyzed to aid in outlining a strategy to improve urban sanitation services. The capital city was chosen because it has the largest urban population in Honduras, it's densely populated peri-urban areas, large number of connections to a sewerage network, significant operational difficulties in providing water supply and sanitation and because there are several different sanitation technologies in use. The conclusions of this analysis may be applicable to sanitation in other urban areas, and could be validated for specific cities.

To expand sanitation services in Tegucigalpa, the socioeconomic composition of the population should be considered, each of which has its own unique characteristics.

Non-poor: Representing 85% of the city's population,[22] this group usually lives in zones with household water and sewerage connections where infrastructure is built by the private sector as part of residential developments.

Moderately poor: Accounting for 13% of the city's population, this group usually settles in outlying areas of the city, where land costs are lower but terrain is steeper. Generally, these zones do not have public services, but access to services gradually increases as communities and aid programs install sanitation infrastructure.

Extremely poor: Representing 2% of the city's population, this group settles in outlying areas of the city where terrain conditions are often adverse. They often settle on high risk hillsides and along stream beds. Given their extreme poverty, these families generally do not have the financial capacity to connect to city water and sanitation services.

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[22] Honduras: Poverty Assessment. Attaining Poverty Reduction. Pg. 95. World Bank, June 2006..

The sanitation alternatives feasible for these different socioeconomic groups and the strategies to implement them vary. Table 11 lists the sanitation solutions typically used by each group in the city and some general conditions associated with the adoption of each technology.

A key aspect of access to sanitation services observed in Tegucigalpa is the relationship between drinking water supply, the ability to connect to the sewerage network and available sanitation technologies. Table 12 shows that the non-poor group always had a water supply connection, and therefore their sanitation solution generally involved their ability to connect to a sewerage network. Where it is possible to connect to one of the city's sewerage collectors, households usually choose that option. If it is not possible to connect to one of the collectors, septic tanks or latrines are generally installed.

The moderately poor and extremely poor groups adopt similar sanitation solutions. If no adequate city water connection exists, latrines are used. Where an adequate water connection is available, these groups' sanitation solutions will depend on their ability to connect to a sewerage network. If it is not feasible for households to connect to a collector, latrines are used. However, if there is an available piped water supply and it is feasible to connect to a sewerage network, the sanitation solution chosen will usually depend on: a) project costs; b) demand of families for the sanitation option; c) capacity and willingness to pay; d) availability of financing, subsidies and cost recovery mechanisms; and e) local organization and capacity to participate in a project. One alternative in this case could be low-cost, simplified sewerage networks (small bore, condominial, etc.).

Table 11
Types of users and sanitation alternatives in Tegucigalpa

Type of solution	Conditions	Sanitation alternatives
NON-POOR (750,000 inhabitants)		
Sewerage network	1- Possibility to connect to a municipal sewerage collection system or network 2- Capacity to pay 3- Adequate drinking water supply 4- Cost recovery mechanisms	1- Conventional sewerage network and connection to a municipal system 2- Simplified sewerage network (small bore, condominial, etc.)
Septic tanks, latrines and other options	1- Possibility to connect to a municipal water network 2- Capacity to pay	1- Individual solutions (septic tanks compliant with municipal standards) 2- Latrines (compliant with municipal standards)
MODERATELY POOR (117,000 inhabitants)		
Sewerage network	1- Possibility to connect to a sewerage system or network 2- Capacity and willingness to pay 3- Adequate drinking water supply 4- Community organization (Water Board) 5- Demand for the technology option 6- Financing, cost recovery and subsidy	1- Conventional sewerage network and connection to a municipal system 2- Simplified sewerage network (small bore, condominial, etc.)
Latrines	1- Possibility to connect to a sewerage system or network 2- Capacity and willingness to pay 3- Adequate drinking water supply 4- Community organization (Water Board) 5- Demand for the technology option 6- Financing, cost recovery and subsidy	1- Improved ventilated pit latrine (VIP) 2- Other types of latrines
EXTREMELY POOR (17,000 inhabitants)		
Latrines	1- Possibility to connect to a sewerage system or network 2- Capacity and willingness to pay 3- Adequate drinking water supply 4- Community organization (Water Board) 5- Demand for the technology option 6- Financing, cost recovery and subsidy	1- Improved ventilated pit latrine (VIP) 2- Other types of latrines

Population data from Honduras: Poverty Assessment. World Bank, June 2006.

Ultimately, the city will have to increase access to sanitation services by expanding its water and sanitation infrastructure. Medium- and long-term investment plans will be needed to expand the networks. To prepare these, water and sanitation master plans must first be updated to determine the most appropriate technical and economic options for expanding infrastructure capacity, setting strategies and prioritizing projects with a pro-poor focus coincident with the country's poverty reduction efforts. However, in the case of Tegucigalpa, rapid population growth is concentrated in poor areas without public service connections. Therefore, unless the trend of migration to the cities slows significantly (which is unlikely), latrines will continue to be the most practical sanitation alternative for peri-urban areas without connections to the city's sewerage network.

Two aspects should be taken into account in order to improve sewerage services in the poor neighborhoods of Tegucigalpa: first, on-site sanitation options in peri-urban areas should function effectively as a transitional solution until a more permanent technology

is implemented. Second, the city's master plan should include a pro-poor approach that ensures equal treatment among citizens and the gradual connection of peri-urban households to the city's sewerage network. To this end, the following should be addressed:

a) Local organization and strengthening (Water and Sanitation Boards). Community organization is essential for the development of poor city neighborhoods, and water and sanitation projects are more effective and sustainable where strong, trained leadership exists. The Water and Sanitation Sector Framework Law (2003) mandates the establishment of community Water and Sanitation Boards. To ensure their credibility and legitimacy, these should reflect principles of democracy, good governance, transparency and accountability, and be free from political influence. To achieve efficient, sustainable operation that benefits the whole community, the current model for Water Boards should be adapted for urban conditions and introduce sound principles of business management and administration.

Table 12
Sanitation alternatives in Tegucigalpa

	Without a water supply connection		With a water supply connection		Subsidy designed to give the poor access to sanitation services
	Without connection to a sewerage network	With connection to a sewerage network	without connection to a sewerage network	with connection to a sewerage network	
Non-poor	---	---	On-site solution (septic tank, latrine)	Sewerage network	---------
Moderately poor	Latrines	Latrines	Latrines	Low-cost network; Latrines	Subsidy
Extremely poor	Latrines	Latrines	Latrines	Low-cost network; Latrines	Subsidy
Expansion of water and sanitation services	■ ■ ━━━━━━━▶				

b) Promotion of sanitation and hygiene. An urban project model should be adopted that promotes sanitation and hygiene based on local organization and individual responsibility, with reoriented institutional support.

c) Technical standards for sanitation in peri-urban areas. Updated technical standards are needed for peri-urban sanitation systems. Standards can help ensure all people's access to effective, reliable and affordable sanitation solutions (latrines, condominial networks, etc.).

d) Maintenance of sanitation systems. Proven, effective local mechanisms are needed to maintain latrines in peri-urban areas. With training and seed financing, small community businesses could serve a potential market for building, maintaining and emptying latrines, and for final waste disposal.

e) A pro-poor approach in development plans for urban public services (master plans, programs and projects). Local governments need sound plans for water and sanitation services that address urban growth tendencies. These plans should harmonize the expansion of the water supply system with the expansion of the city's sewerage network, especially in poor neighborhoods. Moreover, they should promote improved service efficiency and increased access of the poor to these services, with coherent financing and subsidy policies. The plans should also include the expansion of water and sanitation infrastructure and the development of specific projects for water and sanitation service delivery.

The water and sanitation sector in Honduras defines a rural community as one that does not have urban characteristics and has fewer than 2,000 inhabitants. Population density is usually lower and families' economic capacity below those of urban residents. Sewerage networks with wastewater treatment plants are not a viable option, due to high investment costs and the training needed to treat wastewater and prevent environmental contamination. As a result, on-site excreta disposal (septic tanks or latrines) is prevalent in rural areas.

Honduras has two types of rural communities: concentrated and disperse. Concentrated rural communities have populations ranging from 200 to 2,000 people, while rural disperse communities have less than 200 inhabitants.

The national strategy to provide water and sanitation services in rural areas links water supply services with latrine construction and health and hygiene education, mainly targeting rural concentrated communities. The major investment programs, such as FHIS, are based in the capital and only a few have regional offices which are often located far from beneficiary communities.

A key characteristic of investment projects is the variation allowed in per capita investment costs by community size. Generally, the smaller the population, the greater the per capita investment cost. A recent study on the implementation of one rural water and sanitation investment program reported that in towns of between 1,000 and 2,000 inhabitants, investment costs are less than US$ 100 per person, whereas for communities of between 250 and 1,000 people, costs can reach US$ 175 per person. For communities with fewer than 250 inhabitants, costs can reach US$ 300 per person. This cost distribution underscores the importance of considering all variables that can affect investment costs,[23] including for example: a) institutional arrangements for project implementation; b) technologies to be implemented; c) mechanisms to facilitate resource flow and transfers; and d) specific social and geographical characteristics of different rural areas. While these variables are important in rural communities in general, they are crucial in rural dispersed hamlets.

In light of the above, the present analysis is divided into two parts: The first presents general characteristics of rural concentrated zones and some key considerations for improving their access to sanitation. The second part focuses on rural dispersed communities. The analysis is based mainly on information from INE's 2001 National Population Census, which is not directly comparable with ENCOVI's 2004 data, the main reference for the rest of this report.

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[23] Assessment of the USAID Rural Water and Sanitation Program in Honduras - 1999 to the Present. Luis Moncada Gross (CDM) and Anthony Brand (ARD, Inc.), February 2006.

Analysis of rural concentrated areas

In 2001, the population of the rural concentrated areas was 2.08 million, distributed in approximately 4,700 communities ranging from 200 to 2,000 inhabitants each.[24] Graph 9 presents the distribution of communities by size (number of inhabitants).

This graph demonstrates that most of the communities in this category are small. 310 communities (6.6% of the rural concentrated communities) have between 1,000 and 2,000 inhabitants, with a total population of 410,000. By contrast, 4,400 communities (93.6% of the rural concentrated communities) have fewer than 1,000 inhabitants, together totaling 1.67 million people.

Graph 9
Concentrated rural comunities
Distribution of villages from 200 to 2,000 inhabitants

Concentrated Rural:
Number of Communities = 4,712
Total Population = 2,078,533 inhab.

Population range generally used to select communities for investment programs

Size of community (inhabitants)

Number of communities

Figure prepared using INE 2001 Census data.
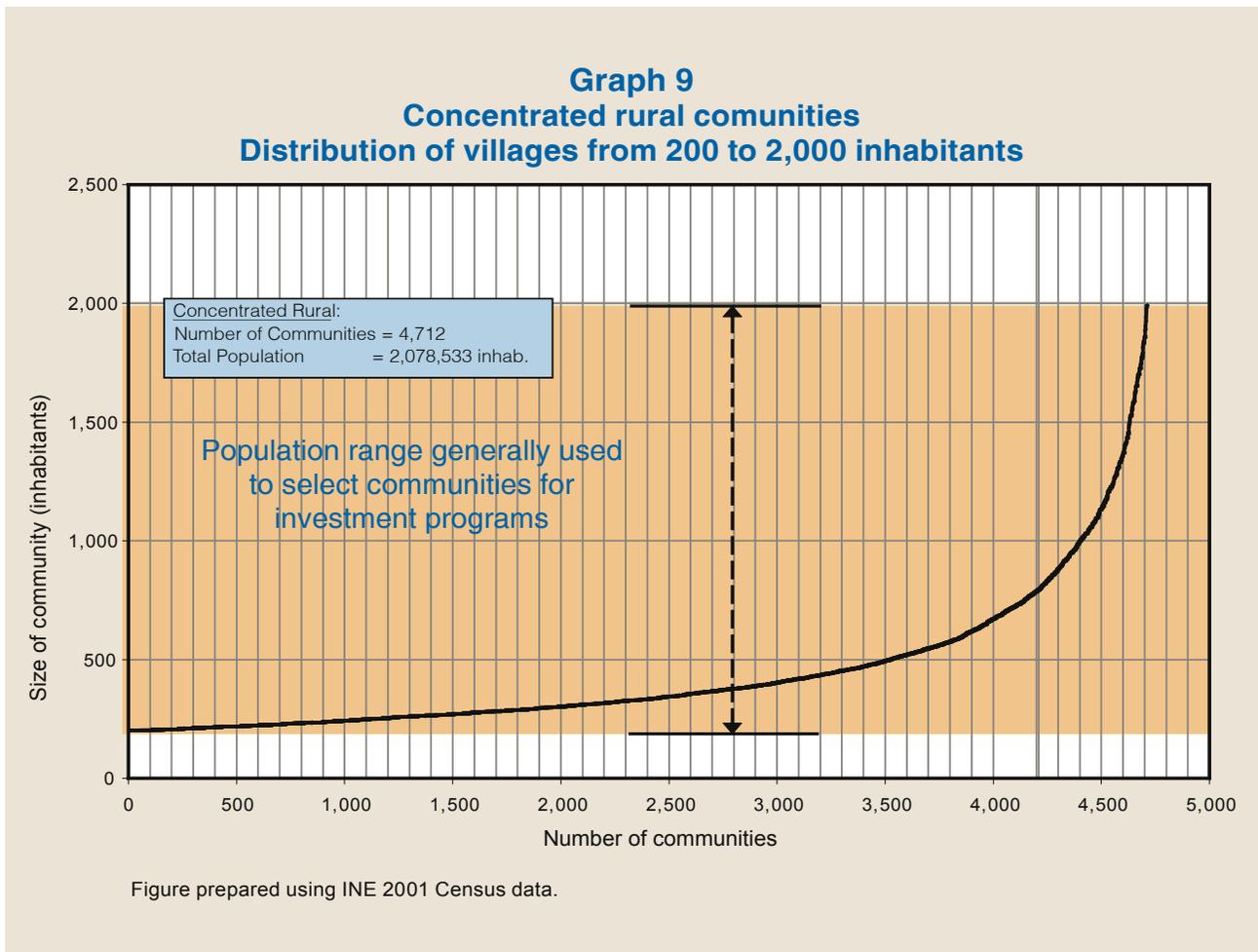
24 Data calculated with information from the INE 2001 National Census.

Rural infrastructure construction has increased since 1980, and was especially intense after Hurricane Mitch in 1998. Investments have mainly targeted rural concentrated communities, since a commonly used selection criterion for investment programs building articulated water supplies is a population of between 200 and 2,000 inhabitants. This has resulted in most rural concentrated communities having water supply systems and sanitation solutions.

An inventory of rural and water sanitation systems carried out by SANAA between 1999 and 2002[25] identified 4,200 communities with water and sanitation systems in 2001,[26] and 4,500 in 2002. Comparing these figures with the number of communities in the rural concentrated strata of the 2001 census (4,712 communities) reveals that at that time, between 89% and 96% of all concentrated rural communities had reportedly received sanitation investments.

The rural concentrated area has a high level of access to sanitation infrastructure. Selection criteria favor large communities over smaller ones, and it is probable that a large percentage of those communities without access are found at the lower end of the population range (200 inhabitants and below).

The focus on sanitation in rural concentrated areas has three main components: a) improving individual and family sanitary practices through sanitation and hygiene promotion and education; b) rehabilitating damaged infrastructure while creating local/family capacity for self-management; and c) facilitating access to sanitation for households without service.

Considering that project implementation by centralized organizations and structures is costly and less effective for these types of interventions, progress in the three areas mentioned above requires new institutional schemes. The community must adopt new, more active roles. Programs should facilitate community organization, training and local management capacities (through promotion, technical assistance and material resources).

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[25] Assessment of the USAID Rural Water and Sanitation Program in Honduras. 1999 to the Present. Luis Moncada Gross (CDM) and Anthony Brand (ARD Inc.), pg. 35.
[26] Analysis of the Water and Sanitation Sector in Honduras. Infrastructure and Service Component in Rural Areas. Ricardo Mairena. Water and Sanitation Program, Pan American Health Organization. March 2003, pg. 36.

The strategy for this segment of the population should include at least the following elements, which proved very effective in the recent FHIS water and sanitation pilot project,[27] and have also been practiced by several NGO programs.

a) **Water and Sanitation Boards.** These boards and their sanitation committees can play a key role in improving sanitation and the sustainability of services in their communities. Congruent with the Water and Sanitation Sector Framework Law, communities now own their infrastructure and their elected boards manage their services. These play a key role as leaders in promoting sanitation in their communities and should manage sanitation projects, thereby facilitating local empowerment.

b) **Sanitation Technicians.** Honduras has used technicians in promotion, community organization, local training and project implementation. SANAA has water and sanitation technicians to implement projects and operation and maintenance technicians to provide technical assistance to local water boards. The Ministry of Health has environmental health technicians with responsibilities that include drinking water quality and environmental sanitation. Various institutions in the sector are considering defining and promoting municipal water and sanitation technicians who would be employees of a municipality or association of municipalities and provide technical assistance to rural communities. The idea is for the sector to define a profile for a technician that could be a standard model for training existing and new technicians residing in the municipalities or regions where they work. Recognition of the importance of water and sanitation technicians by sector actors will be essential for achieving the goals of any national sector plan or strategy.

c) **Municipalities and communities.** These can facilitate the implementation of projects to improve sanitation by channeling material resources to projects, supporting training and other activities. A system for evaluating municipal capacity would need to be developed, as well as models for local agreements, community participation, operating procedures, monitoring and social auditing.

d) **Non-governmental organizations.** These already play a key role as project implementers or as program facilitators and trainers with municipalities or communities.

Methodological tools for projects should be standardized to improve sanitation in rural concentrated communities. Standardized tools could include:

I) Methodologies to assess the state of sanitation infrastructure.
II) Methodologies to identify local practices and preferences regarding sanitation and hygiene.
III) Models for promotion of and education in sanitation and hygiene.
IV) Mechanisms to channel resources to the local level (materials, services, finances).
V) Models for developing and implementing projects to improve local sanitation.
VI) Models to strengthen and train rural Water and Sanitation Boards.

In order to prioritize zones for attention within a municipality or region, the state of sanitation in rural communities must first be assessed. SANAA, Health Ministry, NGO and/or municipal technicians could collect information during periodic community visits, as described in the monitoring section of this document. Ideally, all agencies and local actors would coordinate the collection and analysis of information to identify priority zones.

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[27] The World Bank. Implementation Completion Report. Fifth Social Investment Fund Project. September, 2006. Tegucigalpa, Honduras.

Analysis of the rural dispersed area

In 2001, there were 1.2 million people living in rural dispersed hamlets, distributed in 20,400 communities with fewer than 200 inhabitants each.[28] Graph 10 presents the distribution of these by size (number of inhabitants).

The figure shows that the distribution of communities in this stratum follows the same pattern as that of rural concentrated communities. Smaller communities account for a larger percentage of the total number. In these communities, dispersion is greater and access by road tends to be more difficult, increasing intervention costs.

Table 13 lists communities by size. With an estimated 5.2 inhabitants per household, communities in the

rural dispersed strata are composed of 40 or fewer households. Population density tends to be low in these communities and the dispersion of their dwellings greater.


**Graph 10
Dispersed rural communities
Distribution of Villages with Fewer than 200 Inhabitants**

Dispersed Rural:
Number of communities = 20,393
Total population = 1,202,384 inhab.

Figure prepared using INE 2001 Census Data
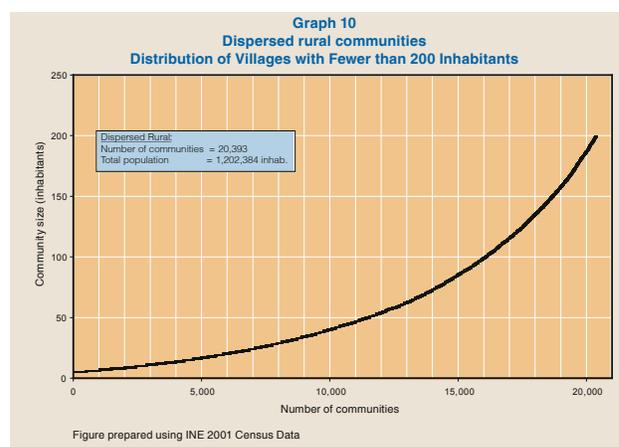
Table 13
Ranges for population and households
in communities with fewer than 200 inhabitants

Range (number of homes)	Minimum population (1)	Maximum population (1)	No. of communities (2)	Total no. of communities	Population (2)	Total population
36 to 40	183	208	525	525	100,111	100,111
31 to 35	157	182	889	1,414	150,150	250,261
26 to 30	131	156	1,182	2,596	169,227	419,488
21 to 25	105	130	1,490	4,086	173,359	592,847
16 to 20	79	104	1,871	5,957	170,182	763,029
11 to 15	53	78	2,667	8,624	171,721	934,750
6 to 10	27	52	4,293	12,917	165,136	1,099,886
1 to 5	5	26	7,513	20,430	103,562	1,203,448
TOTAL			**20,430**		**1,203,448**	

(1) Estimated population considering a density of 5.2 inhabitants per household
(2) INE 2001 National Census

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[28] Data from the INE 2001 National Census.

Analyzing communities sorted by size from largest to smallest, one sees that for a constant number of communities served, population diminishes. This can be seen in Graph 11, prepared with 2001 National Census data for the population range corresponding to the rural dispersed strata. The population of the largest 5,000 communities (number 1 in the following graph) represents 100%. For the next largest group of 5,000 communities (number 2 in the graph), the population declines to 47%. For the next group (number 3 in the graph), the population is just 18% of that of the first group. In the last group, the population is only 10% of that of the first group of communities

Table 13 above demonstrates that communities of between 20 and 40 households each (100 to 200 inhabitants) would total some 4,000 rural dispersed hamlets with a population of 600,000 for the year 2001, representing 50% of the total population of the rural dispersed strata nationally. The remaining 50% of families lives in 16,000 communities of fewer than 20 households each.

Reaching people living in communities of between 100 and 200 inhabitants would require a sector strategy that includes additional elements to those previously described for rural concentrated areas, including: a) participation of trained Water and Sanitation Boards in rural concentrated villages to support sanitation projects in neighboring rural dispersed hamlets; b) participation of the municipality in the dissemination of information on rural sanitation; c) adaptation of simplified, low-cost sanitation solutions using local materials that permit household-level management; and d) information and education campaigns using media that reach the target population, such as radio, local health centers and schools.

Graph 11
Dispersed rural area
Decreasign yield in population ranges

1.... 100%
2.... 47%
3.... 18%
4.... 10%
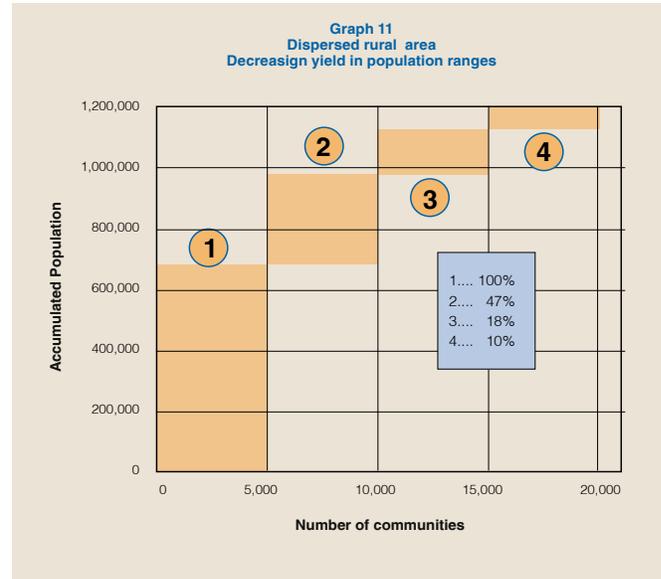
7. Investment, financing and subsidies for sanitation

An estimated US$ 263 million is needed to achieve the Millennium Development Goals for sanitation in Honduras,[29] without considering wastewater treatment.[30] Of this amount, 12.1% (US$ 32 million) would need to be invested in rural sanitation – mainly latrines – and 87.9% (US$ 231 million) would be needed for urban sanitation.[31]

The investment required in urban sanitation infrastructure would consist of expanding existing networks and increasing on-site solutions (latrines) in peri-urban areas. Connections to sewerage networks are significantly more expensive than latrines. Per household costs of a connection to sewerage network can be two to seven times higher than the cost of a latrine.[32]

In rural areas, latrine construction has been partially funded by subsidies and local contributions.

Communities provide manual labor and some local materials, while receiving most building materials at no cost from social investment programs.

In contrast to rural sanitation, latrines in peri-urban areas are usually built using family resources, or in some cases with subsidies and funds from investment programs with peri-urban sanitation components.

Urban sewerage networks are sometimes constructed with private resources by developers who recover their investment through the sale of lots or homes. Municipal funds are also used to build sewerage networks, financed through taxes and user contributions for improvements. The main urban sewerage networks (collectors, interceptors, pumping stations, etc.) have traditionally been financed with non-reimbursable municipal funds.

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[29] Sector Programming based on the National Poverty Reduction Strategy Targets. CONASA, 2005.
[30] The target adopted for wastewater treatment is 50% of the total volume of wastewater generated, which would require an additional investment of US$ 173 million.
[31] This investment includes only sanitation. The investment corresponding to water supply for the same period is US$ 54.7 million for rural areas and US$ 567.3 million for urban areas. From Sector Programming based on the National Poverty Reduction Strategy Targets. CONASA, January 2005.
[32] Data on household costs is from FHIS; per capita costs are from the 2006 UNDP Human Development Report. Per capita cost for a latrine is US$ 66. Per capita cost for a connection to a sewerage network is US$ 170.

Few funds or programs exist in Honduras to finance water and sanitation projects through reimbursable credits to urban neighborhoods or rural communities. Nevertheless, a limited number of Water Boards have developed projects with credits and technical assistance from SANAA, the Tegucigalpa Chamber of Commerce or NGOs. The great majority of these communities repay these funds on time, and many do so ahead of schedule.[33]

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[33] Examples of loans obtained for community projects include the neighborhoods of Villa Cristina and Villafranca in Tegucigalpa, whose Water Boards are making their loan payments seven months early.

8. Monitoring and institutional support for sustainable sanitation services

The building of sanitation infrastructure in rural and peri-urban communities is by itself insufficient for achieving environmental sanitation and improving health. Health promotion and sanitary education are also essential for changing a community's unsafe hygiene practices. But even with these elements in place, monitoring is necessary to provide the support needed by the poor.

If a significant percentage of households does not have sanitation services, or does not always use them or uses them incorrectly, the overall benefits of sanitation in the community will be threatened. This also occurs where sanitation infrastructure has deteriorated from use or age. Sanitation practices, conditions and infrastructure must be periodically monitored and evaluated in rural and peri-urban communities. Effective monitoring can facilitate timely technical assistance to maintain adequate sanitation in a community or family.

In Honduras, monitoring and technical assistance could take place from the local level to the central level and vice versa. Rural communities that have water and sanitation boards have a sound base from which to build local capacity to create and sustain rural sanitation solutions. At the central/institutional level, SANAA has valuable experience with operation and maintenance technicians and the Ministry of Health with its environmental health technicians, both of whom support rural services through programmed community visits. The SANAA program has a team of 80 technicians trained in most areas of basic operation and maintenance of water and sanitation systems. Each technician is assigned about 50 communities or systems for regular visits, for a total coverage of approximately 4,000 rural systems. While the program has operated for more than a decade, to be effective nationally it will require more personnel and logistical support, as well as additional training in management, supervision, evaluation, monitoring and technical assistance for rural basic sanitation.

Sector actors could also coordinate with the Ministry of

Health and its approximately 700 environmental health technicians to strengthen monitoring and technical assistance in sanitation. No national policy yet exists for sharing this type of institutional support, nor is there an official model in practice to be replicated. A detailed institutional support system should be developed and be compatible with sector reforms, the Water and Sanitation Sector Framework Law and national decentralization policies.

In peri-urban zones, monitoring of sanitation conditions and continued support are equally important. Given the higher population density and limited space available for sanitation infrastructure, urban sanitation is often more complex and can pose greater health risks. The water and sanitation board model is not fully developed for poor urban neighborhoods and in some cases may not be compatible with centralized service delivery. Too often, weak or politicized community organizations and a lack of institutional support result in poor management and insufficient capacity to fulfill their potential. Water and Sanitation Board models and their institutional support mechanisms should be modified to effectively respond to needs in peri-urban areas, emphasizing sound business management, democracy, transparency, good governance and accountability.

9. Conclusions and recommendations

The analysis of the linkage between poverty and access to basic sanitation in Honduras leads to the following conclusions and recommendations:

1) **Prioritize pro-poor policies designed to facilitate their access to improved and sustainable sanitation services.**

   This priority should be reflected in sector, municipal and institutional policies, incorporate criteria that promote access of the poor to sanitation, and be applied in all technical and operational planning, in financial policies and in norms for projects and service delivery. The new Water and Sanitation Sector Framework Law stipulates that the National Water and Sanitation Council (CONASA) is responsible for developing a national policy framework, from which other actors and municipalities should develop institutional and local policies and norms for municipal project management, service provision and regulation.

2) **Adopt appropriate and innovative technologies and methodologies for infrastructure and service management, for the creation of sustainable basic services and for technical support.**

   Functionality, reliability, durability and cost are key considerations for creating infrastructure, especially where families live below the poverty line. The selection of appropriate, proven technologies is essential; CONASA's Technical Secretariat could develop standards and implement their promotion and dissemination nationally. It is equally important that appropriate technologies be researched and adapted to contribute to technical issues such as system operation and maintenance, and to improve service management, financing, accounting and commercial aspects.

3) **Stimulate the participation of civil society organizations in decision making and service management.**

   Participation of community-based organizations is an essential element in increasing access of the poor to sanitation and in improving the efficiency of service management, both in urban and rural settings. This participation should take place in a framework of good governance, transparency and accountability, where representative community organizations are responsible for high-level decision-making.

   Although CONASA is responsible for developing general sector policies and strategies and for preparing operational models and instruments, specific local strategies and activities are the responsibility of all sector actors and municipalities. Promotion, education and capacity building should be fundamental elements of a nation-wide sanitation promotion program involving all public and private sector actors.

4) **Involve the coordinated participation of non-governmental organizations and international cooperation agencies in developing sanitation programs.**

   Mechanisms for dialogue and communication among different actors of the water and sanitation sector exist in Honduras, and coordination among non-governmental organizations, governmental and international agencies is essential for the success of efforts and investments for improving services for the poor. A national plan should be developed for ongoing coordination with non-governmental organizations and international agencies. A sector information system that foments the production and management of knowledge useful in decision-making and coordinating actions is also needed.

5) **Create a system to monitor the progress of sanitation programs.**

   Preparation of a national plan requires establishing monitoring mechanisms, which could be designed and implemented by CONASA's Technical Secretariat. It is equally important to consider an information system for the sector that would facilitate the monitoring of programs' and sector progress in improving sanitation. Both the national plan and the sector information system are essential elements.

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