Service Provision Governance in the Peri-urban Interface of Metropolitan Areas Research Project

WSS PRACTICES AND LIVING CONDITIONS IN THE PERI-URBAN INTERFACE OF METROPOLITAN MEXICO CITY: THE CASES OF SAN BARTOLOMÉ XICOMULCO AND SAN SALVADOR CUAUHTENCO, MILPA ALTA

DRAFT FOR DISCUSSION

María Luisa Torregrosa y Armentia
General Coordinator

Researchers:
Catalina Arteaga
Karina Kloster

For more information, please contact:

Peri-urban Research Project Team
Development Planning Unit
University College London
9 Endsleigh Gardens
London WC1H 0ED
United Kingdom
Tel. +44 (0)20 76791111
Fax: +44 (0)20 76791112
E-mail project: j.davila@ucl.ac.uk
Email paper authors: mltorre@flacso.flacso.edu.mx
PUI website: http://www.ucl.ac.uk/dpu/pui

Disclaimer:
This document is an output from a project funded by the UK Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID.

About the project

This report is one of several outputs from the project *Service provision governance in the peri-urban interface of metropolitan areas*. This is a three-year project run by the Development Planning Unit, University College London in collaboration with a number of institutions from developing countries and with support from the UK Government's Department for International Development (DFID).

The purpose of the project is to improve guidance on governance and management of water and sanitation in the peri-urban interface (PUI) of metropolitan areas, in order to increase access by the poor and promote environmental sustainability. Presently there is a gap in the operating knowledge of implementing agencies on the specific problems that arise in the PUI. A premise of the project is that greater knowledge of the social, environmental and governance issues arising from changes in the management of water supply and sanitation in the PUI, and more specifically of the impact on these of different and changing regulatory frameworks, would be beneficial not only for the poor but also for these agencies and other local agents.

The project examines the cases of five metropolitan areas, each with different and changing service management regimes influencing the governance of basic service provision: Chennai (India), Dar es Salaam (Tanzania), Cairo-Giza (Egypt), Caracas (Venezuela) and Mexico City.

A. Allen, J. Dávila and P. Hofmann
Development Planning Unit
University College London

Table of Contents

INTRODUCTION

This report aims to characterize in general terms the impact caused by processes of organizing and managing water in the user population in the two cases selected for our study: San Bartolomé Xicomulco and San Salvador Cuauhtenco, in the Milpa Alta borough in the Federal District of Mexico (Mexico City).

The outline used as a guide for this stage was the hypothesis that the impact of this management would affect the population in the case studies differently, according to a series of contextual elements: characteristics of the housing environment and the processes of population and occupation of land (type and legality of settlement, method of transfer or acquisition of property); forms of exercising leadership and institutional relationships with local authorities (Agreement of Zero Growth).

The impact on the living conditions of residents caused by different forms of water management depends on the possibilities and dynamics in which the population develops different strategies for survival. The living conditions of the residents in the selected case studies derive precisely from current processes of peri-urbanization noted in previous reports outlining the main features of Milpa Alta: the presence of different kinds of ecosystems, socially heterogeneous groups, problems of land ownership, irregular settlements, and pressure on basic services, among others. As this report will show, the settlement of the selected locations has been the result of a process of impoverishment of one part of the population in the borough dedicated to agricultural labor, a loss of the value of traditional agricultural production, and deforestation. Another phenomenon that has influenced this process is the need for housing caused by natural population growth. From the perspective of the city, the occupation of these plots of land has occurred because the population living in zones geographically close to Milpa Alta look for housing and because new immigrants from other states in Mexico need land. The illegal market of land and the presence of illegal real estate brokers in Mexico City have also contributed to this occupation.

These characteristics constitute the framework in which the families from the selected locations develop strategies to improve and maintain their living conditions. In this context, access to and management of water constitute one more element in their daily practices to maintain these conditions. As this report will show, the population has access to water through what we have denominated different *methods of access to water* which include generating original mechanisms of organization and self-supply from their situation of poverty and extreme need. However, this organizing causes an important impact on their conditions and quality of life in the following aspects: conditions of health and hygiene, deterioration of the environment, and economic income of the community. In individual terms, the methods used to access and manage water affect work loads and times, particularly for women and children. In the atmosphere of social relations, the characteristics of the water system and the methods of access and management have an impact on connections between residents, generating collaboration but also conflicts related to the resource.

The report is limited in terms of generalizations, since it was carried out as an exploratory study. This character is reflected in the findings of the research, oriented around the formulation of working hypotheses, more than determinant conclusions, although these are based on a diversity of methodological techniques used, including direct observation based on fieldwork developed throughout the year. The advantage of this kind of work

resides precisely in the possibilities opened for discussion, rebuttal or testing of these hypotheses, based on a more in-depth analysis of the same case, as well as contrasting it with other similar studies.

The study is organized into three central sections. The first section aims to characterize the particular context of the case studies, in the dimensions relative to land ownership and the processes by which the locations selected were populated. It also includes a socio-economic profile of the population interviewed. The second section is a description of the management of the water system in the cases selected, including aspects related to methods of access to water, as well as the tasks and times of transportation, quality of water and the ways it is used by the population, the characteristics of sanitation, the role of organizing and the resence of community conflicts. Finally, conclusions are developed, with a reflection on the impact different forms of water management have on the quality of life of the inhabitants of San Bartolomé and San Salvador.

1. GENERAL CONTEXT OF THE CASE STUDIES

1.1 Mexico City and its Relationship to Rural Areas

In Mexico, the development of the urban system had the same characteristics as many other third world countries, where urban acceleration came hand in hand with industrial development. Because this process was concentrated in the capital of the country, the population of the Federal District increased more in proportion to the other states in Mexico, between 1940 and 1980 having the largest population in the country, followed by Mexico State. In the first stage this growth occurred according to industrial growth policies, which caused a territorial expansion towards rural areas in the north of the city.

Beginning in 1980, the rhythm of the economy decreased, increasing activities in the tertiary sector, which groups informal labor or labor linked to underemployment. Population and urban growth did not occur at the same rate as in previous eras. However, people continued to be expelled from the central zone of the city to the periphery. Throughout this period there was a stagnation of growth in the Federal District and investment in statistics, since population growth would be produced in higher proportion in Mexico State.

This marks a second stage: with the tertiarization and depletion of these lands, growth expanded to the southern zones. This is how Milpa Alta (characterized as rural and indigenous) became the last borough to be incorporated into the metropolitan system of the Federal District in 1980. This brought about the division into territories which can be observed currently in the Federal District: an industrial northern zone and a southern zone with traces of a peasant lifestyle on the verge of disappearing.

Therefore, it is still possible to detect a number of agricultural spaces located around the Federal District that were traditionally oriented around producing basic foods for the domestic market, but in the last few decades have been converted towards new horticultural and floricultural crops, in coexistence with the production of basic grains for consumption. In addition to this new productive orientation, it is possible to detect the proliferation of non-agricultural, commercial and service activities, which bring about new socio-spatial ways of life and social organization (Delgado, 2001).

1.2 Milpa Alta

Within this framework is the borough of Milpa Alta, which presents particular characteristics that place it within a peri-urban profile because of a heterogeneous mosaic of natural, productive and urban ecosystems where heterogeneous social groups in constant transition have settled. This brings with it a confluence of different institutions, both formal and informal, with diverse functions in spatial and physical terms.

In addition to the above information are the presence of homes in conditions of poverty, the location of natural resources consumed in towns and cities, transition between rural and urban features, pressure on natural resources (land and water), and an increase in pollution generated by the growing concentration of population and industries.

Therefore we can say that Milpa Alta has economic, social and cultural features which combine urban and rural characteristics. This can be observed in the different types of

ground usage, the presence of an indigenous population, the persistence of forms of organization related to the native peoples of the country and the celebration of festivals and traditions that show the indigenous and *mestizo* origins of the zone.

At the same time, Milpa Alta has been affected by institutional changes implemented in the country in the last few decades. The different units of production found in Milpa Alta, *ejidos,* communal and private lands[1], have been affected by diverse reforms implemented by the political decentralization and liberalization of land: property reforms, commercial openings, decrease in prices, difficulties in access to credit, transformation of regulation and the institutionalization of rural sector support.

The demographic growth of Milpa Alta is a result of the general growth of the Federal District and of its late economic incorporation as part of the metropolitan area. It is only recently when a trend of growth in the population has begun to be detected.

At the same time, the natural growth of the population and the arrival of immigrants from other states have generated some conflicts in the urban structure, such as the change in ground usage in central zones, the pressure on transportation infrastructure in central parts of the towns and the alteration of traditional types of buildings. There is pressure to modify rural ground usage to urban usage as well as authorizing higher population densities (Distrito Federal, 1997). This process has led to the development and consolidation of *parajes*, defined as settlements of people in areas outside of the city limits, which demand a different type of service, including an expansion of the sewerage and piped water systems.

This differentiation between natural growth and growth caused by immigration brings consequences for the water and sanitation system, giving it very particular characteristics since Milpa Alta is the borough at metropolitan level with the lowest percentage of water service inside the home. The system of water supply shows unique characteristics, since there are serious problems in water supply, especially in the highest zones of Milpa Alta, because of topographic characteristics and problems confronted in the dry season.

Because of the above, water supply is carried out by giving turns to the population, distributing water in different locations by zones, days and hours. In each town, valves are opened and closed on different days and schedules. The task of opening and closing the

[1] In Mexico, ejidos and agrarian communities are forms of social or collective property instead of private ownership. Before the reform to article 27 of the constitution, they were not forms of property, but of usufruct, which implied the prohibition of their sale and only the possibility of inheriting it from ancestors. According to the Agrarian Law, “The nucleuses of ejido population have their own judicial personality and patrimony and are owners of the lands that have been given to them or that they have acquired by any other title.” They have their own administrative organs: ejido assembly, commissary and vigilance commission. The supreme organ is the assembly where all the ejido members participate. Ejido lands by use are divided into: lands for human settlement, lands for communal use and parceled lands. In communities, their judicial recognition implies the existence of the Commissary of Communal Goods as an organ of representation and administration of the assembly of commoners in the terms established by the communal statue and custom; the special protection of communal lands which makes them inalienable, imprescribable and non-mortgageable, unless they are given to a society in the terms of article 100 of this law; and the rights and obligations of the commoners according to the law and the communal statute. The community implies the individual state of the commoner and allows the owner to use and enjoy his parcel and to cede his rights over the land in favor of his family members and neighbors, as well as the use and benefit of common goods in the terms established by the communal statute.

valves is the responsibility of the Borough Unit of Potable Water and Sanitation. This system began to be applied in 1995.

At the same time, it is possible to note the presence of different actors who participate in the system of water supply in the area: the DF and Borough governments; the sub boroughs (territorial communications); the private sector and the community. While formal rules exist for the supply system, a process of applying informal rules has been developed to demand and partially resolve the problems caused by poor quality or absence of the service. The relationship between these actors, in addition to collaboration, brings a series of problems that do not always have pacific solutions.

In addition, vulnerability, erosion and pollution of the system of distribution occur, since they depend in a large scale on the recharge capacity of deep wells and on performance of electrical pumping and repumping plants.

1.3 Land and Deforestation[2]

The way natural areas are protected constitutes a fundamental challenge in a city whose ecology is on the verge of collapse, as is the case of Mexico City. Environmental pollution and lack of water are just some of the problems which, far from being solved, continue to be aggravated as time goes by.

In terms of sustainability, Milpa Alta represents a strategic resource for the city; it is included in the proposals for ecological rescue of the Valley of Mexico and is fundamental for its sustainability. It is located completely on Conservation Soil and plays a central role in the recharge of the Valley of Mexico aquifer. Although Milpa Alta currently represents the most rural borough in the Federal District, with significantly large forests for recharging the aquifer, the pressure caused by demographic growth has affected possibilities for it to continue this way.

The forest has been diminished because of two important phenomenons: the incursion of paper mills on one hand, and the transformation of woodland into agricultural land on the other. Currently the main ecological challenge is new settlement caused by population growth. Although agricultural activity in Milpa Alta has slowed this growth, it has not managed to completely detain it because of the constant impoverishment of small farmers and the inefficiency of commercial networks. For this reason, land that was once agricultural is being sold for residential use at very low prices.

The lands in Milpa Alta were given to the original settlers through different legislative resolutions that protected the original titles of the residents. In this way 17.994 hectares were initially granted to the nine original towns of Milpa Alta, and 6,913 hectares were given as communal property to San Salvador Cuauhtenco in 1953. These resolutions aimed to settle the agrarian conflict which arose during the years of the revolution between the towns belonging to the Confederation and San Salvador by recognizing the legitimacy of both parties' documents and dividing communal lands. [3]

[2] Extracted from Gomezcésar Hernandez Iván, *La palabra de los antiguos: territorio y memoria histórica en Milpa Alta.*

[3] Because of its location, Milpa Alta was at the periphery of the *Zapatista* movement directed by Emiliano Zapata, with the slogan, "Land belongs to those who work it", during the Mexican

However, the conflict was aggravated by the entry of the Loreto and Peña Pobre Paper Mill, founded in 1928, which exploited the region's forests with periodic permits from the Federal Government until 1946. In 1947, the Industrial Unit of Forest Exploitation was created and the concession was extended for 60 years to the Loreto and Peña Pobre Paper Mill, decrees which accelerated deforestation from then on. The paper mill intensified exploitation of forests in Milpa Alta and directly intervened in economic and political aspects in the region by influencing communal leaders and Borough authorities. In this way the agrarian conflict and the struggle for the forest were intertwined, creating a less than encouraging scenario for the original population that became impoverished while being prevented from using the forest.

The population defended their right to the land and woods through organizations that were many times caught up in violent situations until 1974, when the Organized Communal Members of Milpa Alta (COMA) were recognized to represent the nine towns of Milpa Alta.[4] These events ended the era of struggle as clandestine logging was finalized and the group of loggers who had controlled assemblies and served as political tyrants for the paper companies was dissolved.

Because of these actions of struggle, the towns of Milpa Alta managed to consolidate their own communal organization which is completely unique because, in contrast to the sole representation of all communal members prescribed by agrarian law, in Milpa Alta a general representative was named for all members, as well as one representative for each town. These representatives enjoyed great legitimacy among their population and their actions were not limited to agriculture, but many times they acted as spokespersons for their communities. Because of this, even today communal organization continues to be a political and cultural reference of primary importance in the region, as was stated in previous reports regarding the figure of Coordinator of Territorial Communications.

Another of the causes of deforestation was the conversion of forests into fields for cultivation. This occurred because of the proliferation of the cultivation of vegetable-nopal, which has increased considerably with a recent boom. By making agriculture economically viable, the nopal has been transformed into an important obstacle that has impeded or at least slowed the process of urban growth in the region.

The characteristics of vegetable-nopal cultivation allow Milpa Alta farmers to directly control the productive cycle. The plant does not require agricultural machinery, has a high

---

Revolution (1910-1917). Milpa Alta became a natural barrier between Mexico City and the central region of *zapatismo* in Morelos. In 1916 the new government began to distribute land in order to stop Zapata's influence in this strategic region. When the armed conflict ended with the promise to solve the agrarian issue, numerous small farmer groups in the country and particularly in the central-southern zone, organized and demanded land. For Milpa Alta this caused a rebirth of the agrarian conflict with San Salvador when this town began to organize for their territory to be recognized on February 4, 1921.

[4] As has been mentioned, Milpa Alta is one of 16 political boroughs in the Federal District and is made up of twelve towns. Out of them, Villa Milpa Alta, San Pedro Atocpan, San Pablo Oztotepec, San Lorenzo Tlacoyucan, Santa Ana Tlacotenco, San Jerónimo Miacatlán, San Francisco Tecoxpa, San Juan Tepenahuac and San Agustín Ohtenco make up the Confederation of Nine Towns. In addition is San Antonio Tecomitl, more culturally related to the neighboring borough of Tláhuac, and San Bartolomé Xicomulco and San Salvador Cuauhtenco, which belonged to the Xochimilco borough until the early 20th century.

capacity for self-financing, and organic fertilizer continues to be more important than using agrochemicals. At the same time, productive units are small farms with little land, and they generally constitute a family business where the woman is in charge of commercialization.

Sixty percent of the primary sector of Milpa Alta is dedicated to the cultivation of nopal; however, to create a larger source of income the introduction of alternative crops is being contemplated, as well as the creation of a collection center of nopal and vegetables for wholesale and retail, and industrialization and commerce of nopal and meat produced in the borough.[5] This situation has caused Milpa Alta to be considered a mono-productive borough. In the 1993-1994 production cycle, nopal constituted almost 80% of the value of agricultural production in Milpa Alta and approximately 40% of the value of agricultural production in the entire Federal District.

The cultivation of cold climate fodder crops such as barley and oats grown in clearings in the forest is another even more pronounced cause of deforestation. In addition, although large scale logging does not exist, small independent logging continues, many times by the Milpa Alta farmers themselves.

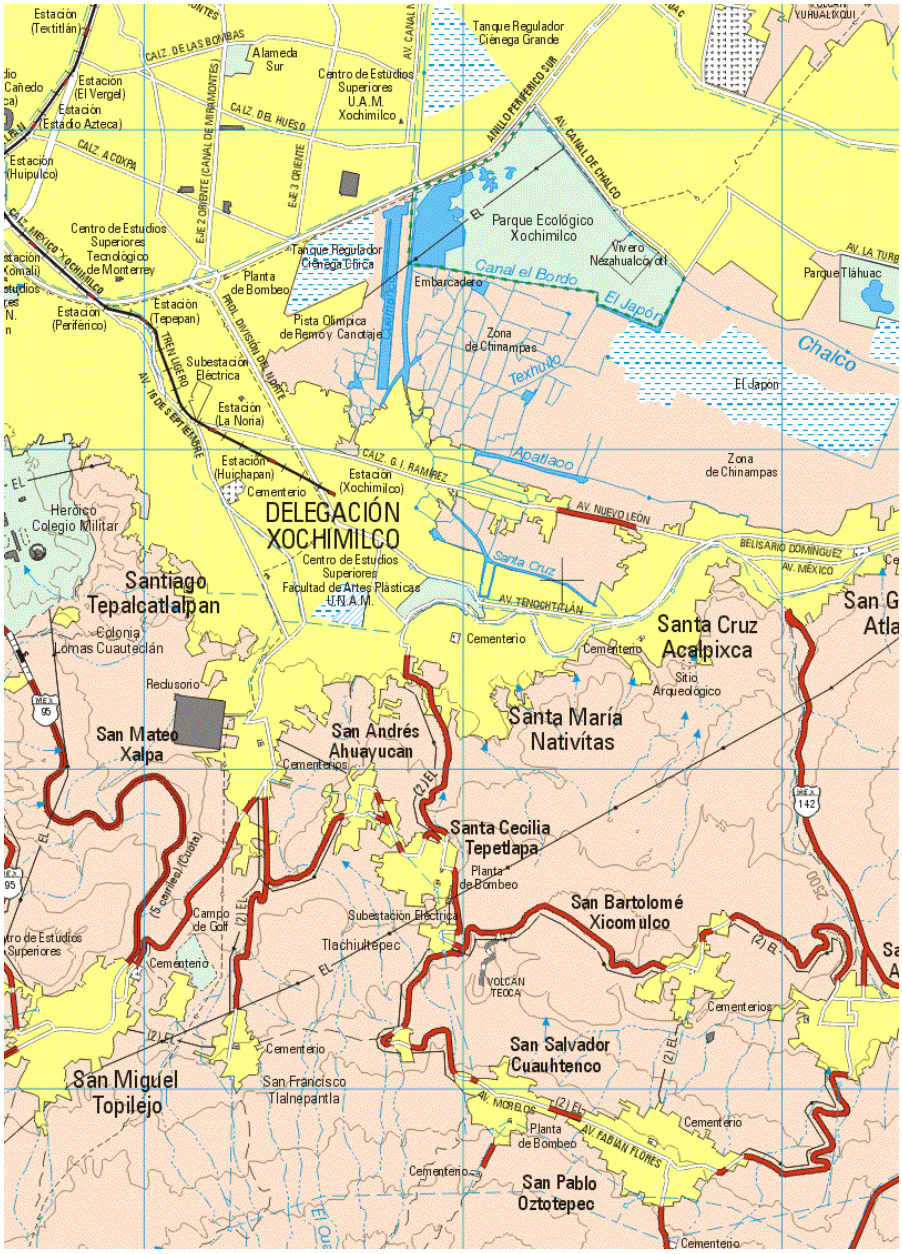
Finally it can be said that while it could not stop urban growth, this return to small farming (particularly nopal) constituted another of the elements that caused deforestation along with traditional agriculture.

Despite this return and peak of agricultural activities, which occurred following the expansion of nopal production, urban growth has not stopped. The observations made during field work showed that the majority of sales of lands for residential use have to do with the degradation which the small farmer economy of the country has constantly suffered. This is also a result of the distribution of communal lands which has repercussions on traditional farmers in Milpa Alta as well. In this way it is understood that the productive conversion necessary to generate networks for commercializing vegetable-nopal and other products cultivated in the region has not reached the necessary expansion. In the last ten years an incipient industry of transformation and processing of nopal has begun but also confronts problems with commercialization and distribution of its products.

In the particular case of our two locations studied, an important differential characteristic was observed. In contrast to San Salvador, in San Bartolomé a new appraisal of green

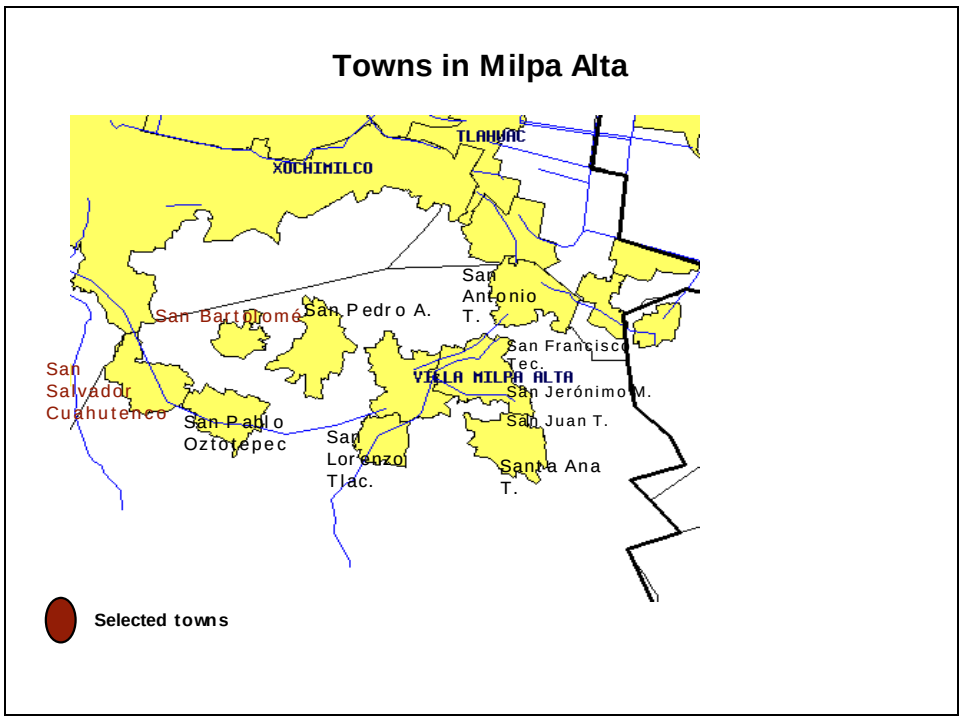
[5] Raising animals has maintained a trend of decrease over the last few years, as a result of the change in ground usage and a lack of incentive. This is reflected by a decrease in cattle inventory. The breeding activity most preponderant in the region is the breeding and fattening of pork, cattle and sheep, an activity complemented by the cycle of sacrifice carried out at the local slaughterhouse from where meat is sent to many butcher shops around the city. Another relevant activity in this area is the sacrifice of sheep for elaborating *barbacoa*, or roasted sheep meat. This production reaches approximately 3000 sheep per week and its principal origin is outside the borough. It would cause a significant impact to encourage this activity from its origins, raising and fattening sheep within the borough to satisfy this significant demand. Bee production reaches an approximate volume of 40 annual tons of honey. The VII Agricultural Cattle Census of 1991 registered 5,251 Rural Production Units, 26.15% of the total units in the Federal District. 4,581 of this total are dedicated to agricultural activities. 249 units of urban property and 2,651 houses with agricultural activity were counted. All property, land, plots or animals raised for meat, milk or eggs that have been managed under the same administration are considered Rural Production Units. /www.milpa-alta.df.gob.mx/milpa/economia.html

areas has promoted building weekend houses destined toward the upper middle class fleeing from the hustle of the city to reside an hour away in a forested area, which makes the value of land go up and constitutes a sort of “green reserve”. The reforestation programs in San Bartolomé are an example of this phenomenon that, although incipient, could generate new incentives by revaluing land.



2. SELECTION OF CASE STUDIES

Two towns in the Milpa Alta borough, San Bartolomé Xicomulco and San Salvador Cuauhtenco, were selected as the places where in-depth research would be done, according to four indicators based on different evidence: 1.Characteristics of WSS, 2.Economic Activities and Level of Income, 3.System of Land Ownership, and 4.Organization and Institutional Relationships.



Regarding WSS, both towns represent situations where there are difficulties regarding access to water because of the altitude where they are located. However, the situation in San Salvador is more dramatic, reflected by the low availability and dosage of water. San Salvador also has a lower percentage of houses with water connections, either outside or inside, and a higher population that supplies itself with water through water trucks[6], showing a situation of higher precariousness in regards to access to water. In addition, a higher percentage of the population in San Salvador lives in irregular settlements outside the city limits than in San Bartolomé.

[6] Trucks transport water in tanks to zones with scarce or no access to water. Generally, they are operated by the Borough, although there are private companies dedicated to selling barrels**.** Supposedly the trucks provided by the Borough are free to the population, although according to the testimonies collected, on some occasions, people must pay for this service. Trucks have programmed stops in the zones that are found outside of the city limits and are recognized by the Borough and non-programmed stops in the zones outside of the city limits and not recognized. The demand for trucks is solicited directly by the people through the Service and Citizen Attention Center.

According to information from the Coordinators of Territorial Communications[7], 95% of the population in San Bartolomé has all basic services covered, including water, sewerage and pavement, while in San Salvador, the percentage of the population living in irregular settlements, most of them without access to these services, is around 50% (Interview with assistant coordinator from San Salvador, June, 2003). This shows a higher percent of the population without access to water in San Salvador.

This leads to the more extended existence of informal and illegal situations in relation to services in the case of San Salvador. Irregular settlements cause strong pressure on services, not only demanding them, but using them informally. This is reflected by the practice of "hanging off" power lines (connecting illegally) and connecting clandestine taps for water (Interview with the San Salvador Cuauhtenco Assistant Coordinator, Sergio Mancilla Rosas).

Regarding the **economic activities** of the population, while both towns are similar in their Economically Active Population and type of occupation (mainly workers and employees according to census data); our observation and the information collected show that in San Bartolomé the population is mainly a worker community providing manual labor to different companies and factories; the majority leave town to work in other boroughs of Mexico City and suburban municipalities, and only 10 to 15% of the population works in agriculture (interview with San Bartolomé Xicomulco Coordinator). In the case of San Salvador, there is a higher combination of activities, and agriculture is developed by 60 to 80% of the population, according to information provided by the San Salvador Cuauhtenco Assistant. Regarding **income level**, although a situation of marginality predominates in the borough, there is an important difference between the two towns, since San Bartolomé on average presents a higher income level than in San Salvador, allowing for a comparison based on different economic situations.

In the entire borough, the **property system** is a complex question. However, in the selected towns there are interesting peculiarities. In the case of San Bartolomé the prevalent form is small ownership, since the majority has a private contract to buy and sell their land, although these lands are included within the 27 000 hectares of communal land in the borough of Milpa Alta, which is why San Bartolomé Xicomulco also has communal representation. This shows a completely contradictory situation that only the agrarian courts have the possibility of resolving, a process which has already begun.

In the case of San Salvador, land is communal, as in all the towns in Milpa Alta, but usufruct is private and the level of irregularity regarding land ownership is higher, since the buying and selling of land and the parceling of cultivation areas is more intense.

Neither of the two communities belong to the base nucleus of the 12 traditional towns in Milpa Alta, although the annexation of San Bartolomé Xicomulco is approved and therefore they have a communal representative. Meanwhile San Salvador is not allowed to attend communal assemblies because the representatives of the other towns affirm that they log the forest the most and have the least respect for natural resources.

[7] The coordinators of territorial communications are authorities elected by traditional means, who serve as mediators between the population and Borough institutions. They do not currently have legal back-up, although they are considered legitimate by the population and in practice they serve as community representatives and as the link between towns and Borough authorities.

Regarding **organization,** San Bartolomé is one of the towns with the highest levels of community organization. In addition, initiatives are being developed with educational institutions outside of the borough for ecological rescue of the location and a project to develop San Bartolomé as an area of ecotouristic attraction within Mexico City. According to the interviews carried out, San Bartolomé appears to be a more integrated community than San Salvador because of its traditional organizations and authorities.

According to the coordinator of San Bartolomé, the relationship with Borough authorities is quite cordial and based on proposals and concrete projects.

In the case of San Salvador, the organizational level is lower and more traditional. In addition, a higher level of conflict exists within the community and between this community and the Borough authorities, exacerbated by subjects such as water and access to services.

In summary, we would like to point out that both towns selected represent the socio-economic, institutional and WSS characteristics of the entire area. However, they present important unique features that we believe allow us to go into depth to differentiate on the performance of WSS, institutional relationships and the diverse methods of access to water used by the population.

2.1 City Limits vs. *Parajes*. Forms of Water Supply and Selection of Settlements for Interviews

There is a population difference between the two locations: San Salvador has 10.323 inhabitants and San Bartolomé has only 3.423. In the latter case, this makes for a better distribution of labor on the part of the coordinators and a higher grade of formalization of relationships and methods of administering public services.

As we mentioned before, in both towns, there is an area within the city limits –a formal populated area with legally registered property and access to all services– and a zone outside the city limits that has irregular settlements, called *parajes*, more or less distant from the urban center. The in-depth study was done in this zone, since it has the poorest population in terms of water, although differentiations do exist within the *parajes* which characterize the conditions by which they receive support for water supply from the Borough. These differentiated conditions regarding water supply constituted a criterion for the selection of *parajes* where interviews would be carried out.

In general terms, in these locations outside the city limits the population either has access to water through water tank trucks sent from the Borough or has no access to water for free and must pay for it. The details of the methods of access will be discussed further. Those that formally receive free water from the Borough through water trucks are the inhabitants included in the 1997 census. That year, the Agreement of Zero Growth[8] was signed, establishing the amount of water in cubic meters that corresponded to each *paraje*. This water is provided at what are known as *programmed stops.*

[8] As mentioned in the last report, the Agreement of Zero Growth refers to an agreement between the territorial coordinators and the *parajes*, in which they prohibit new settlers. The population living outside the city limits was counted and the agreement states that only that population appearing in the census can have access to basic services authorized. New settlements not in the census will not have the right to any services.

The Borough also receives applications through the Center of Services and Citizen Attention (CESAC) for supplying water to those who do not currently receive any or who receive very little. For this purpose, the Borough provides water in trucks at what are known as *non-programmed stops*.

There are also *paraje*s that do not have any support from the coordination or the Borough. The inhabitants of these *parajes* must buy their water, as will be discussed further along, and this is generally an illegal procedure.

Chart 1. Supply of Water From Borough Trucks to the Inhabitants of Milpa Alta

CLASSIFICATION		**TYPE OF SERVICE**
Within city limits		All network services
Outside city limits*	(1) Within Agreement of Zero Growth	Trucks – programmed stops
	(2) Outside Agreement of Zero Growth	Trucks granted on request – non-programmed stops
	(3) No support	No borough trucks – self support

*Despite being outside city limits, some *parajes* have taps granted by the Borough, as will be discussed in more detail.

The total amount of drinking water supplied through programmed stops to benefit 7000 residents of Milpa Alta is divided as follows:

Chart 2. Amount of Water Delivered by the Borough Trucks to Each of the Towns in Milpa Alta

Towns	Annual cubic meters	Population
San Bartolomé Xicomulco	8548m3	222
San Salvador Cuauhtenco	20578 m3	2228
San Pablo Oztotepec	9822 m3	884
San Pedro Atocpan	9872 m3	886
San Jerónimo Miacatlán	3800 m3	14
Santa Ana Tlacotenco	4196 m3	77
San Lorenzo Tlacoyucan	3376 m3	190
San Antonio Tecomitl	20000 m3	1559
Villa Milpa Alta	12020 m3	940
San Juan Tepenahuac	996 m3	City limits have not grown
San Francisco Tecoxpa	1210 m3	City limits have not grown
San Agustín Ohtenco	202 m3	City limits have not grown
Total	90,500 m3	7000

Chart 3 – Amount of Water Programmed for Each *Paraje* in San Bartolomé and San Salvador

Parajes	"Official" programmed stops	Families
San Bartolomé (222 personas)		
Huicalco	1	20
Metenco	4	21
Carretera Santa Cecilia	3	8

Location	Programmed stops	Families	Volume	Regularity
San Salvador Cuauhtenco – 2228 personas				
Tehuixtitla I		33		
Tehuixtitla II		9		
Tehuixtitla III		8		
Coartoxtitla		14		
Tlaquexpa	1		10 m3	
Acachinamix		15	20 m3	Twice
Lamesa		12	10 m3	
Sacatepec			10 m3	
Morelos Low Zone		18	20 m3	Twice a week
Morelos Medium Zone		19	20 m2	
Morelos High Zone		16	20 m3	Twice a week
Morelos Tlacochicalco		16	20 m3	Twice a week
San José Acachinamix	1 additional			
Terracería Entryway		17	20 m3	Twice a week
Terracería Medium Zone		16	20 m3	Twice a week
Terracería End Zone		12	20 m3	Twice a week
Jacaranda End Zone		13	20 m3	Twice a week
Jacaranda Entryway		13	20 m3	Twice a week
Copaloacan I		12	10 m3	Weekly
Copaloacan II		12	10 m3	Weekly
Toluca Jazmín			10 m3	Weekly
Toluca II		13	10 m3	Weekly
Toluca Puente		14	10m3	Weekly
Tiapilco		n/s	10 m3	Weekly
Cuatepec Low Zone			10 m3	Weekly
Cuahtepec High Zone		18	10m3	Weekly
Jalapa III		16	10m3	Weekly
Omaxa		16	10 m3	Weekly
Xoctongo I, II y III		52	40 m3	Weekly
Aguatixpla	New stop		10 m3	Weekly
Frontera II		26	20 m3	
Frontera III		13	10 m3	

Chart 4. *Parajes* that Receive Non-Programmed Water from the Borough. San Bartolomé and San Salvador

San Bartolomé	San Salvador
Apilitintla Copexalco	Tlaquexpa La Virgen San José Acachinamix Jazmin parte baja Iturbide Sur Aguatixpla

According to the classification of water supplied by the Borough (Chart 1) *parajes* were selected within both towns, as observed in Chart 5, in order to interview people residing in settlements with different kinds of assistance from the Borough.

Chart 5. Selection of *Parajes* in San Salvador and San Bartolomé

Type of Assistance	**Town**	***Paraje***	**Population**	**Average Time Living There**	**Number of interviews**
Programmed Truck	San Bartolomé	Huicalco	20 families	8 years	3
	San Salvador	Oluca		2 years	3
		Tlatechalco	16 families	7 years	2
		Cuartoztitla	17 families	5 years	4
Truck by request (non-programmed)	San Bartolomé	Apilintitla	17 families	11 years	2
No truck support	San Bartolomé	Paraje del Conejo	4 families	26 years	2
	San Salvador	Paraje No Name	2 families	25 years	1

2.2 Characterization of the *Parajes*

Parajes are built on land that was deforested in order to cultivate. The crisis of traditional forms of cultivation has exceedingly affected the determination of the ancient settlers or their children to stop using land to plant traditional crops, such as corn, oats, fava beans, squash and fodder and sell their portion of the land for residential use.

During the visits, we observed two kinds of *parajes*: those made up of relatives of the previous owner, who no longer use the land to plant but divide it among their heirs (Paraje del Conejo and Paraje Nuevo) and those who use the land commercially through the formalization of sales (the rest of the *parajes*).

Despite the Agreement of Zero Growth, people continue to arrive, as seen from two pieces of concrete data collected in interviews. First, the names of the *parajes* visited do not coincide with the names the person in charge of the water trucks gave us, indicating that they are constantly supplying water to more and more *parajes* without carrying out the corresponding control. Secondly, there are cases of people who do not have water, despite living in *parajes* that supposedly do have water supplied by the Borough; one

family interviewed had been living in the *paraje* of Cuartoztitla for 10 years without being able to receive regularized water supply.

Bought-and-Sold *Parajes*

Because the land was originally communal, in many cases it cannot be legally bought and sold. Instead, land is sold in a common agreement between parties. Therefore buying these parcels is convenient because of their low price, with no kind of legal papers or services (there are currently parcels of land sold at $45 the m2; other people interviewed bought land 10 years ago at $13 the m2).[9]

For this reason this place is the ideal destiny for those in the city who come from successive migrations, with generally precarious jobs where rent is an obstacle for improving their quality of life, thus the possibility of a house of their own is highly attractive.

These *parajes* have been consolidated for between 10 and 20 years, approximately. The average time the people interviewed have lived there is 8 years: 10 years in San Bartolomé and 7 years in San Salvador, which shows that San Bartolomé has established some control in administration and possibility diminished the entry of new settlers. In San Salvador many families continue to arrive and settle in the periphery of already existing *parajes*.

The way people obtain a plot of land is through networks of friends or relatives who know about their need to have a place of their own and inform them about others who are selling. Then, once a plot of land is obtained, other people occupy the same house until they manage to build a room on the same land or on an adjacent plot. One third of those interviewed currently lives on the same land as their relatives, whose houses have been built in this way.

The service issue is not an impediment for migration because historically the Federal District became a mega-city this way and access to services was never denied to settlers after a certain period of time. Taking into account the political client-patron practices of the governments in power, it makes sense that new settlers imagine that with time a certain delegate or coordinator will change the policy and it will even be possible to belong to the city limits.

In this sense, the Agreement of Zero Growth should be carefully analyzed to see up to what point it is actually helping to stop migration to new settlements.

Inherited *Parajes*

Parajes developed by passing down land from one relative to another do not have any type of services since generally access is difficult and organization is deficient. They are made up of relatives who have come looking for their own place and therefore these *parajes* are small, made up of family networks, preventing the possibility of generating sufficient pressure to achieve free water from trucks supplied by the Borough.

[9] These prices are in Mexican pesos. Currently, one dollar equals approximately 11 Mexican pesos.

2.3 Characteristics of the Population Interviewed

In general, the average number of residents per home is 5. They are generally large families and one quarter of those interviewed are from extended families.

The families that make up bought-and-sold *parajes* are generally families whose migration began with parents or grandparents who came to the Federal District from other states and then their children settled in Milpa Alta looking for a place, land and a house of their own.

What this new location offers them is the possibility to have their own land and build a house. This is why the houses are generally not unstable, but are built with good materials and extended little by little. These *parajes* are highly disorganized. There are no square corners for the streets; instead they are arranged depending on plots. However, the buildings on them are generally of regular quality, although there are exceptions.

The people who have always lived in the *parajes* are the heirs of the first people who logged the forests to convert the land for cultivation. These people continue to live without any kind of service, since they do not have large settlements and their houses are disperse across the fields.

For this reason these *parajes* are generally made up of several relatives in different buildings with different levels of advancement. In the same way as the first group of people, the need for a home of their own to live in without needing to pay rent generates this kind of settlement, although access to these lands is difficult and many times they must walk for up to half an hour to reach the closest highway and public transportation.

Socio-economic Level

The average age of the heads of households interviewed is 42 years: 40 years in San Bartolomé and 44 in San Salvador. Although data is insufficient to generalize, this coincides with the idea that San Bartolomé is smaller and its inhabitants are younger than San Salvador.

Twenty-five percent of the heads of households interviewed were women. They were generally widowed or separated from their husbands. In the case of two of them, they received economic support from their children, who have had access to better education and obtained better jobs.

The rest of the masculine heads of households are married or live in civil union with their partners. The majority of these people have only basic education; they know how to read and write and completed some or all of primary school.

Therefore the occupation of the majority (60%) of these heads of households is in informal jobs such as assistant or peon bricklayers, vendors, or gardeners. The other 40% of those interviewed work in more formal occupations such as employees, technicians with their own shops or factory workers. In any case, it can be said that given the conditions they are living under, they are from a low economic class living in poverty, although not extreme. However, they are quite limited with regard to their access to services.

3. CHARACTERISTICS OF THE WATER AND SANITATION SYSTEM AND MANAGEMENT IN THE CASES ANALYZED

After analyzing the information collected in interviews done in the selected *parajes* in our case studies: San Salvador C. and San Bartolomé X., a chart was proposed to show the methods of access to water depending on the different actors involved in providing water, as well as the formal or informal character of this supply. With this chart, we located the concrete ways by which the population has access to water.

3.1 Methods of Access to Water Used by the Residents of the Selected Locations

The initial characterization of water supplied by the Borough to *paraje* residents allowed us to select specific *parajes* for interviews. By analyzing this material, we were able to analyze the diversity and heterogeneity of the ways the population interviewed has access to water in more depth. Based on this empirical evidence, a chart was elaborated based on the concrete practices found. This chart was classified as a more general typology of methods of access and management of water and is applicable to other cases, as it can be "filled in" with specific information from each particular case.

The chart combines two main categories detected in the methods of access to water used by the population: one is related to the *actors involved in supply*, who can be grouped into three classes: state, market and community. The other category is related to the *type of practice* carried out, differentiating between formal and informal practices. If we cross-examine both categories, we find that the forms of access to water used by people in Milpa Alta in the analyzed case studies can be grouped the following way[10]:

Chart 6. Methods of Access to Water

	Type of Practice	
Actors Supplying Water	**Formal**	**Informal**
State	Tap Truck with programmed stops Trucks by request	Truck
Private/Market	Private trucks Large Plastic Jugs	Private trucks
Community	Tap-truck (community organizing)	Gift Collection of rainwater Clandestine taps

a) Formal-state/informal-state

Beginning with the upper left cell, we have the ways the state provides people with access to water in a formal manner. This means that access to water occurs on the part of the state through different institutions and is regulated or recognized under law and by

[10] We are aware that a generalization of this hypothesis in statistical terms would require a long term study with a longer extension and more depth of analysis. However, based on the interviews as well as the field work carried out throughout the project, it seems plausible to propose this chart of methods of access to water.

authorities. In this modality, we have access to water through taps, trucks with programmed stops and trucks by request.

Taps are located only in some *parajes*, in zones located within the Agreement of Zero Growth. Residents have access to water from the taps through hoses, according to times determined collectively according to what the Borough or the valve worker has decided, as stated in previous reports. The organization for distribution is done by families living in the *paraje* where the tap is located, each of whom have access to water for a determined time when the water arrives.

"And then this grew. More people arrived, and the water from the truck wasn't sufficient anymore. We decided to go to the Borough to ask for home taps, but since we are outside the city limits they didn't give us that service, because here the primordial services are given only within the city limits, so they didn't authorize our taps. We asked for taps, because in Paraje San José they are taking water from San Bartola. They wanted to put in a pipe from San Bartola to their paraje and we went to ask why they were going to get water and we weren't, so they authorized a public tap for us and nothing more."(Int.5)

"They give us water every third day at the tap, by hour. They give us three or four hours a day and we organize by number on a list of families. There are 17 families, around 80 people including children. We get half an hour of water each. We have to connect hoses and when a person's turn comes, they grab their hose and connect it to their barrel." (Int. 5).[11]

Although in general we found an equitable distribution of the resource in the *parajes*, this distribution is not exempt from problems between neighbors. This is a result of the fact that not everyone has access to water from the tap in all the *parajes*. The reasons stated for this have to do with the amount of people on each plot of land, the time they had been occupying the land and the relationships they had with *paraje* representatives. However, this aspect should be explored in more depth.

"I don't have access to water. Right now since the neighbor doesn't live here he gave me his water. I bought the land seven years ago but it's only been one year since we came, precisely because of the problem of water." (Int.15)

"A lady gives me two little barrels because the representative says she can't give water to two families. She gives water to my daughter-in-law, only two, and she doesn't give any to me. Sometimes she gives me a little barrel and when the lady can, she gives me two." (Int.14)

As for the supply of trucks from the Borough, these are separated into two different classes, as mentioned, related to the Agreement of Zero Growth. The residents included in the Agreement have access to trucks from the Borough at programmed stops in fixed places where the trucks arrive regularly and supply water to a certain number of 200 liter barrels –generally 2 to 3 – for all the families counted in the 1997 census.

The population not included in the Agreement only has access to water from Borough trucks by directly requesting them at the Center of Services and Citizen Attention (CESAC), the Borough organ in charge of receiving, processing and responding to requests for public services required by the population of the borough. For this population, there are some *parajes* that have non-programmed stops, where the Borough occasionally

[11] A chart attached in the appendix shows the numbers of interviews and their location in the *parajes*, with the characteristics of the type of water supply.

supplies water from trucks. However, a significant number of the population does not have access to any kind of water support from the Borough, including trucks by request.

This population does occasionally has access to water from Borough trucks, but only informally, by giving tips to truck drivers so they will give them part of their excess water or by supplying themselves with water without formal access through other people located close to programmed stops. These trucks from the Borough that supply informal access correspond to the "state-informal" method of access in the upper right cell. As the Director of the Potable Water Department of the Borough stated regarding informal arrangements between the population and truck drivers: *"If they tell him (the truck driver) to leave them a little more (water), they work it out themselves."*

Q: And how is the truck service? Does the truck come?
A: If you want your water, you know it costs 400 pesos. If not, you must live without water and oh, what horror, it is despairing.
Q: And who do you pay the 400 pesos to?
A: To the truck driver.
Q: Are they from the Borough?
A: Yes, but supposedly they say they shouldn't charge, but that's just what they say. The truth is that they charge. (Int.2)

A: We have to pay $650 (per truck) to the Borough and I buy it every three months. We buy it directly from the Borough. (Int.5)

b) Formal-Market/Informal-Market

Another method of access to water used by the population interviewed is through the market. The lack of access and regularity of water forces residents of the locations to buy it. In cases where the population has no access to any other source of water, residents buy private trucks every certain period of time, and jugs[12] for drinking water. In cases where there is tap and/or free truck water, they can buy water with less regularity and combine that water with jugs for drinking water.

Q: The water from the truck isn't enough then?
A: What happens is sometimes the truck doesn't arrive, or it takes a long time coming. We have to carry water in jugs.
Q: Do you have a car?
A: No, we have to bring it in trucks and pull it in a cart.
Q: And who does that?
A: My father and my husband and my brother.

[12] Drinking water is often sold in large plastic jugs.

Q: And what do you use the water in the jugs for?
A: Just for drinking, so we have to go wash clothes at San Lorenzo. They charge 3 pesos for washing, but it's hard work to carry the wet clothes back. (Int. 3)

Q: Here how does the paraje get water?
A: With private trucks.
Q: Where do the trucks come from?
A: They come from Milpa Alta.
Q: Do you ask for it or do you have to pay for it....?
A: No, we pay for it. We wait here in the entry and they bring it.
Q: In the entry to where?
A: On the highway. We wait there and if it can't come that day it comes the next day, or the third day.
Q: How do you know when it will come?
A: The trucks come by every day, and you ask for it for the day you need it. (Int.4)

Formal sales on the market refer to buying bottles or jugs of water, or buying water from vendors authorized by the Borough. Informal sales on the market are through private illegal vendors. Since this is a method outside of norms, it was not possible to interview these vendors and it is difficult to identify them. When we broached the subject with the authorities, they were generally ambiguous.

Q: So tell me about water. How do you get water?
A: Look, I'm tired of asking the Borough, the sub-borough with the coordinator, the PRD party, the PRI party, I've asked the whole world for help and nobody helps. We live in this very isolated place far away from everyone, so no one has wanted to support me. I've been to the Borough, the sub-borough with the coordinator, I've asked many people, but the truth is no one sends us a truck.
Q: So how do you solve it?
A: Well we buy our water.
Q: How often do you buy it?
A: I buy my water every eight days. A car comes and sells us the tank of water for $15 pesos. (Int.13)

Assistant Territorial Coordinator: They are construction trucks that have a little water tank.
Q: And where do the construction trucks get the water?
Assistant Territorial Coordinator: They take advantage of nighttime and take water from the network, from town, from the neighbors' water, and he's the one who sells the water, he sells it at around 150 pesos per tank. (Int.3)

As Chart 6 shows, those who do not buy water from private trucks buy drinking water in jugs, and there are extreme cases where they have to buy both. However, although water is supplied by the Borough through trucks and/or taps, the majority of the families interviewed still have to buy water from a truck and/or jugs, at least in the dry season, which lasts in the Federal District from November to March or April.

c) Formal-community/Informal-community

The last cells in the access chart correspond to the methods of access to water by organizing or exchanging within communities, understood as the population living in *parajes*. Within the formal community context, there is community organizing around the tap for water supply. Although the tap comes from formal-state access, described above,

the way the *paraje* residents organize for access to this water is community-oriented in some cases, with a representative to coordinate and make sure agreements are fulfilled, as will be discussed in more detail below. Sometimes, these representatives also organize and/or watch over the supply and distribution of water from trucks bought by the entire settlement or a group of families.

At the same time, other informal methods include water given or exchanged between neighbors or relatives, fundamentally for drinking. This situation is quite common among those interviewed and they are occasional methods of access to water. Water can be given for free, although other times it is given in exchange for a fee for tipping the truck driver or for payment in favors.

"...some times I barely finish a barrel, and people who have children need more water so I give it to them, because I… I don't like to be egotistical. I need it… but I give my comadre *who does many favors for me a barrel. But it is mine to give. I don't sell it, I give it away, or sometimes if she sees I don't have any money, she'll give me some for the water… you have to know how to get along and live with people, no?" (Int.10).*

Another way the population has access to water is by collecting rainwater. In the rainy season, people collect water in different ways.

Although only one of the people interviewed recognized access to water through clandestine connections, we suppose that a significant number of users generally do have access to water this way, as it was recognized by the authorities and some users as a widespread practice in their *paraje*. However, the existence of fines established by the community for those who connect illegally was also noted.

Community Organizing: the Role of Women Leaders

The role of the *paraje* representatives is central for the ways and methods through which the population has access to water, particularly in the case of state and community methods. In general in the *parajes* there is a representative of the entire settlement or the families that reside in it. This representative is in charge of searching for solutions to problems related to services in her location, by carrying out diverse activities such as sending requests or communicating with the pertinent authorities, in this case, principally the town coordinator.

The way the representative is elected is not very clear; there are contrasting versions of the ways this is carried out. One of the versions is that elections are held in neighbor assemblies by the majority of votes, while others state that the representative is elected by direct voting. Another form of becoming representative seems to be from direct action by their own initiative.

Q: And how did you become a leader of this?
A: Well, just because I was being an argüendera.
Q: Being what?
A: An argüendera, *a troublemaker.*
Q: ...And how much time did you dedicate to the paperwork?
A: Well the truth is it takes a long time, coming and going. For example, for the pavement, I went to see López Obrador –the chief of government of the Federal District- and the truth is it takes a long time. (Int.2, paraje representative, San Bartolomé)

Q: How were you elected?
A: By majority of votes. We got together to talk, we presented our issues, and it was by majority of votes.
Q: How often does a representative change?
A: For now we haven't changed. Since we started 4 years ago, I have been the representative of my neighbors. And we have worked well. (Int. 5, paraje representative)

Q: If you were to quit being representative, how would they decide on a new one?
A: In a meeting the delegates come and by majority of votes a person is elected who they want to be representative. The land delegation comes especially and puts together a vigilance committee.(Int. 12, paraje representative)

The role of the *paraje* representative in terms of water can include diverse tasks[13]:

-Sending requests to the Borough authorities for installation of taps for access to water in the community.
-Sending requests to the authorities for Borough trucks to supply water to the *paraje*.
-If water is supplied through a tap, the representative is responsible for organizing and making sure rules established for neighbors' access to water are fulfilled (generally there are times established for each family to access water at the tap).
-Resolving conflicts caused by water issues between neighbors.
-Organizing neighbors for different ways they can request water (signatures, meetings with authorities.)
-Collecting money from neighbors to give a tip to truck drivers.[14]

Q: And for the water truck to come?
A: Blanca (representative) went to Milpa Alta with neighbors. I don't know how she did it but she said we needed water.
Q: Did all the neighbors go?
A: No, just a few people.
Q: And who did they go see?
A: A man named Camacho. (Int. 8)

The better or worse "success" of the leaders in organizing for water depends partly on the location of the *paraje*, whether or not it is within the city limits and whether it is included in the Agreement of Zero Growth. However, it is also possible to hypothesize –although it would have to be studied more in depth– that this organization also depends on social capital and the connections the representative has or establishes with authorities in different levels of government: territorial communications, Borough and even the Federal District government.

Q: Will it always be her?

[13] These tasks were extracted from interviews and field observation.
[14] This activity was noted in the case of a person in charge of water, that is, a different person from the representative who had the specific task of collecting money to give to the truck driver.

A: A little while ago there was a little problem and she said, "I'm retiring." But everyone agreed that it has to be her again, because she knows how to mobilize for certain issues. Since she has studied, that helps her move, how she talks, how she expresses herself, that helps her a lot. (Int. 8)

A: Since she has facility, she has time to mobilize more and she has a better way of communicating with the authorities. When we needed water, she was the one who started that, 5 years ago, she started to mobilize for water [...] We agreed to put her in charge so she could write to the Borough or the coordination.
Q: And now that you have water, what does she do?
A: After the water, came the street, the pavement. In case you didn't notice, it wasn't finished very well. (Int.1)

The representative must have certain characteristics, such as being willing and having the time to process different forms to request services and water. In addition is the personal disposition of the leaders. One of the features repeated in all the cases analyzed was the fact that in general the representatives live in the *parajes* since the first settlers arrived.

There are other *parajes*, however, where there are no representatives or leaders to take charge of organizing for services. In this case, the neighbors work out their problems individually and sometimes collect signatures for specific water requests.

Q: Is there any form of organizing?
A: My mom went to the Borough to ask for a water truck but no. The next day a man came to see how many of us there were and he never came back. Then a woman came and a boy, but nothing… (Int. 3)

Q: Have you talked with any authorities about water?
A: Yes, we have turned in applications, but the other coordinator that was there came here and told us he was going to help us but he didn't do anything. And then the next one came and we turned in a request and nothing.
Q: Did you turn it in individually?
A: It has the neighbors' signatures.
Q: How many families are there here?
A: There are 7 of us.
Q: And everyone signs?
A: Yes and also the people in the paraje down there. Once even the people from Milpa Alta came and they told us they were going to bring us water and the stop was going to be down there where you came in. It was going to be for everyone, but it never came. And we have turned in several requests but nothing happens. (Int. 4)

3.1.1 Methods of Access by Town

In Chart 7 the specific methods of access used by different families are classified by interview and town. If we study the differences between the towns, it is possible to observe more regularity of services and attention on the part of the Borough in San Bartolomé, compared to San Salvador. There is more access to tap water in the first town, while in San Salvador there seems to be more of a need to buy water, especially in large plastic jugs, which might be a sign of a lower quality of water supplied to this town. In addition, there are more widespread practices of water exchange between members of the *parajes* in San Salvador. As was noted in the previous report, according to the interviews, there was more general awareness in this town of the existence of clandestine taps and illegal connections.

In San Salvador there are also more programmed stops because of a lack of tap water.

The lack of trucks by request stands out in both towns, perhaps a sign of a lack of community organizing, ignorance about the method of sending requests through formal institutions or the impossibility of answers to the requests made by neighbors on the part of the authorities.

Although informal methods were observed and narrated by some of those interviewed, declarations on informal state and market methods were more difficult to obtain than on informal community methods.

At the same time, San Bartolomé stands out for its high level of organization, according to observation and data obtained from other sources. This organization occurs in different aspects of the settlement and daily life, as mentioned. However, organizing around water is a central issue for the role of community representatives.

Finally we can state that community methods for collecting water do occur, but privately and individually. There were no communal forms of collecting or reusing water observed in the interviews.

Chart 7. Methods of Access to Water for the Population Interviewed in the Selected Locations. San Bartolomé X., San Salvador C.

	State Formal			**State Informal**	**Market Formal**		**Market Informal**	**Community Formal**	**Community Informal**		
	Tap	Programmed stops	Truck by Request	Borough Truck	Private Truck	Jug	Private Truck	Tap-truck /community	Clandestine tap	Gift/ Exchange	Collection of rainwater
San Bartolomé											
I1*	X		X		X			X			
I2	X		X	X	X			X		X	
I3				X	X	X					X
I4					X		X			X	X
I5	X	X		X	X			X			X
I6**	X	X						X			
I7**	X	X						X			
San Salvador											
I8		X			X			X		X	X
I9		X				X		X			
I10		X				X		X			X
I11***	X	X			X					X	
I12		X			X				X	X	
I13					X						
I14	X					X				X	
I15		X			X					X	
I16		X				X				X	
I17		X			X						X

*I1 corresponds to Interview 1, etc.
**Incomplete information
***Collective interview with *paraje* residents (not counted in frequency statistics)

3.2 Transportation and Storage of Water

The different forms of transportation and storage of water in homes are related to the type of source where the water comes from (truck, tap), the topography and altitude of the land, the distance from barrels to the house, and the socio-economic level of the home which might allow for construction of a cistern or motor installation.

For storage of water, the families interviewed generally use barrels and some use cisterns and tanks. The water they receive from trucks or from the tap is generally stored in 200 liter barrels in a specific place for each *paraje* and transported from there to the houses in different ways: hoses, buckets, or jugs. In general tap water is transported with a hose and truck water with buckets or hoses. Water transported long distances can be carried in jugs.

Water is stored in the homes in the deposits mentioned. Transportation from the cistern to the different parts of the house and for diverse needs is generally done with buckets. In certain exceptional cases, some families have an electric motor to transport water from the cistern.

The cisterns are generally located outside the home. Barrels are found at the truck stops and in the home outside or inside, in the places where water is needed most: the bathroom and the kitchen.

People living in the most isolated places, in generally those with the least access to water from the state, generally need jugs to transport water over long distances. However, this causes damage to the environment, as in one of the places we visited where the broken or unusable jugs are accumulated in a place near the *paraje*. The isolation also means more time and physical effort for transportation.

The possibility to use hoses occurs fundamentally in zones with difference in altitude, where hoses allow water to descend from the barrels at the programmed water stops to the houses. This does not always occur easily, since hoses break, are blocked, etc., in addition to the fact that sometimes users must vacuum the hose in order for the water to descend and fill the storage barrels.

Chart 8. Storage and Transportation of Water in the Selected Locations. San Bartolomé X., San Salvador C.

	Storage of Water				Transportation of Water		
	Barrel	Cistern	Tank	Jugs	Hose	Bucket	Jugs
San Bartolomé							
I1	B***	H/B			X	X	
I2		H	H		X	X	
I3	B		B			X	X
I4		B	B	B		X	X
I5	H	H			X		
I6*	B					X	
I7*	B	B				X	
San Salvador							
I8	B					X	X
I9	B					X	
I10	B					X	
I11**	H/B		H/B		X	X	
I12	H	H/B			X	X	
I13			H/B		X	X	
I14	H				X		
I15	H				X		
I16	H/B				X	X	
I17	H				X		

*Incomplete information
**Collective interview with *paraje* residents
***H= hose B= bucket. This implies that the family interviewed carries water from the form of storage noted with a hose and/or bucket.

In general almost all activities related to drinking water are carried out by women. It is important to mention here that storage as well as transportation of water are daily tasks that absorb an important amount of time, and sometimes imply use of physical force. For this reason, when transportation tasks are very hard, they are generally carried out by the youngest women in the family. If there are no young women, they can pay others to transport water. This situation occurred in the case of an elderly woman who paid the children in the community for these tasks.

The truck drivers fill tanks and cisterns and receive a tip for this labor.

The use of barrels and tanks for storing water is similar in both towns. However, there are differences in cistern use. Although the existence of this type of storage instrument is not very common, it occurs more often in the case of San Bartolomé. This could be a result of the characteristics of the land, as well as the economic conditions of the families interviewed there.

3.3 Tasks and Times of Water Management

As mentioned, the different activities related to buying, receiving, transporting, and storing water fall on of the women in the family and in a lesser measure on their children and spouses. Although when the women interviewed were asked about the people who carried out water tasks, particularly carrying water, they sometimes answered “Whoever is home,” the field work showed that those who are mostly at home are precisely the women. As the socio-demographic data shows, the majority declared themselves to be housewives (62% of those interviewed) or to carry out some labor independently or at home (3%), which implies that they spend most of their time in the home.

In the case of San Bartolomé, there would seem to be a higher propensity for different members of the family to take responsibility for transporting water, at least in the perception of the women interviewed. In San Salvador, the activity is recognized first as the responsibility of the women and children and then of the entire family.

The amount of time invested in water supply varies significantly depending on different factors: the location and distance from the source (tap or trucks), the altitude of the land and the system of transportation. Sometimes in the dry season families must travel several kilometers to obtain water, particularly those who do not have any regular access. In addition, they must invest a great physical effort to transport the water.

3.4 Water Conflicts

We consider that conflicts because of access to water occur because of the methods of access to the resource used by people in the locations selected. Throughout this project we have identified four types of access to the resource in the *parajes* located outside the city limits in the towns studied, related to the settlement and change of ground usage, processes of migration, the distance from the urban center, as well as the forms of leadership and the level of regularization of the *paraje*.

Of the seven *parajes* studied, the closest to the city limits, Tlaltechalco in San Salvador and Huicalco in San Bartolomé, have been founded for the longest, between 20 and 25 years, and their composition is mixed. They are partly inhabited by the children and grandchildren of the original owners who cultivated the land, although now for different reasons ground usage has changed and the land has been transformed into areas of human settlement. In these *parajes*, there are also people who bought their plot from a communal member or *ejidatario* that put their land up for sale. The legal situation of land titles is not completely clear since at the time of the transaction or inheritance from parents to children, Article 27 of the Constitution prohibited sale or rent of communal or *ejido* property. Therefore, in the best case scenario people have private contracts of sale or proof of their parents’ land rights. The majority of people do not have papers to prove they own this property. This population, as has been stated, has access to water through trucks from the Borough and in some cases have communal taps with service regulated by day and time every week. Only in the *paraje* of Huicalco does the service cover all residents, although it is still only partial.

Secondly, there are *parajes* that only have water trucks, as in the *parajes* Oluca in San Salvador and Apilintitla in San Bartolomé. These *parajes* are more recent, or at least there are parts of the population who have arrived in recent years. Also, the majority came from

southern boroughs nearby Milpa Alta. This fraction of the population frequently has to buy water in jugs to cover their basic needs, such as drinking and cooking, or ask for water from those who have taps, who sometimes accept and give water selectively to some, but not to all.

The third type of population includes those that are farthest away from the city limits. They do not have water or any other kind of service and are made up of the poorest population in the *parajes*. However they are divided into two kinds of zones:

a) *Ejido* or communal lands parceled between five or six members in the same family, which do not make up a significant population. These *parajes* are between 20 and 25 years old. El Conejo in San Bartolomé and Paraje No Name in San Salvador

b) Recently settled *parajes* characterized by populations of recent migrants who did not buy the land from the original owners, but from people who said they were owners of the land, and the property is disputed by more than one person. They have serious problems of regularization of land ownership. Cuartoztitla in San Salvador.

This differentiation in population, in times of migration and formalization in access to the resource and in the security of land ownership establishes a hierarchy among the marginal population. The majority of the *paraje* representatives belong to the population with access to taps when their *paraje* has one. In some *parajes* they were even the people who organized the population to request the tap. They also have access to borough trucks and interact with the authorities to request incorporation in the census, access to trucks and, in some cases, access to tap water. In this sense, the relationship with the representatives, generally women, is central, since access to water obtained or negotiated with the authorities depends on it.

The population outside the Agreement of Zero Growth is the most vulnerable, because they do not have the resources and because they do not have formal or semiformal recognition to appraise their settlement or access to resources. Therefore the state does not provide them with water and they must obtain it through informal methods, through the market or by informal community methods stated previously. This group is seen with a certain level of distrust by those that are included in the Agreement and to whom they must turn to if they need water from the tap or to buy it from someone who has more than enough to give away, in the best case scenario.

The most recurring conflicts occur because of “stolen” water. Those who have water rights accuse those who do not of stealing their water. This situation causes tension and conflicts in at least three of the *parajes* visited. Another important aspect is how the Agreement of Zero Growth affects the dynamics within the population and the role of “watchdogs” that the population included within the Agreement adopts in relation to those who are not included. Their role is to notify the authorities when new settlers arrive and to tell settlers they are committing an illegal act, assuming a role that actually corresponds to the authorities.

4. QUALITY, USE AND TREATMENT

4.1 Quality of Water

As we have mentioned, the diversity of existing methods of access to water in the area is ample. Each of these methods is linked to different qualities of water. In general, the population has the perception that the water they drink is good, particularly those who have formal-state methods of access, and especially those who have tap water. However, the population with truck service from the Borough has a less favorable opinion of the quality of water they receive. Both the Borough authorities and the health clinics in Milpa Alta affirm that they periodically monitor both tap and truck water. Trucks are filled with water from the sources that supply the water network in the borough.

The opinion of the *paraje* residents regarding tap water is the following:

Q: What do you think of the quality of the water?

A: I think it is good, because a long time ago the people from the health clinic came to do a study and they said the water was good. ***Paraje Apilintitla -San Bartolomé Doña Rosa, I2***

A: It is good. Health inspectors have come and they put some instruments in and they tell us if we can drink the water or if we have to boil it, and yes, we can drink it without boiling it. ***Paraje Huicalco – San Bartolome Sra Mariana, I5***

The opinion of the residents regarding truck water is not so favorable.

Q: What is the quality of the water from the truck that comes?

A: Sometimes they bring it super dirty, really dirty. ***Cuartoxtitla San Salvador I15***

A: Well I would say regular, no? …Sincerely sometimes we don't have enough money to buy jugs of water, so we have to drink the water from the barrels. ***Cuartoxtitla San Salvador I17***

The difference in the quality of water does not depend only on the source of origin, tap or truck, which is obvious up to a certain point since the truck water has a higher level of manipulation and more forms of storage. There is also a difference between the towns of San Salvador and San Bartolomé. The statements that the water is not very good were fundamentally made by the population of Cuartoxtitla in San Salvador. This town is also where all taps are clandestine, for which reason they are not monitored by the Borough for quality, the opposite of what happens in San Bartolomé where the taps were agreed upon by local and Borough authorities and they are periodically monitored.

The population interviewed generally treats their drinking water in some way, even when they consider it good quality. When they have access to tap water they separate drinking water and sometimes give it additional treatment such as boiling or chlorating it. However, the families located in the zones farthest away outside the Agreement of Zero Growth established by the population with the Borough authorities, have access to the resource only by borrowing or receiving water as a gift from the population that does have it. The fragility and vulnerability of this population in relation to water is extreme, since they depend on the good will of their neighbors or their own ability to buy water, at least some jugs for drinking and cooking. It is precisely these sectors of the population that generally drink the water just as it comes, since they do not always have gas or firewood to boil it or

sufficient income to buy the drops to chlorate it. They only have access to dry firewood in the forest which they can collect but they must transport it in small amounts they can carry or transport. This situation was very clear in the case of San Salvador in the *parajes* of Tlaltechalco and Oluca.

Method to Purify Drinking Water

	Number of Cases
None	3
Boil	3
Chlorify	1
Boil or chlorify	3
Strain and chlorify	1
No information	5
Total	16

4.2 Uses for Water

With regard to the different uses of water, we can state that in general water is used for all kinds of things, no matter the source. However, if there is more than one source there is a certain differential use depending on the origin. In general tap water, considered by the population to be of better quality when they have access to it, is used for drinking and cooking food, and water from public or private trucks is used for the toilet, to wash clothes, bathe and clean the house.

The population that only has access to water from trucks and occasionally buys water in jugs to complete their needs makes no differentiation in use. They use all water indistinctly for drinking, cooking, bathing, cleaning the house, washing clothes, etc. The population farthest away from the city limits that receives no water from Borough trucks and has a difficult time buying bottled water or water from private trucks depends on the good will of their neighbors to lend them water or give them tap water to drink when they have excess. This sector not only pays the most for the resource, but also has to intensely recycle water to use it to the best advantage possible.

CHART 9. Type of Use Given to Water According to Methods of Access

	Formal State		Formal Market	Informal Community	
Uses \ type of access	Tap Water	Borough Trucks	Private Trucks	Water Collection	Total
All kinds*	5	4	8	2	19
Drinking	1			2	3
Bathroom and Washing		3			3
Mopping				1	1
Total	6	7	8	5	26

* All kinds include drinking, personal hygiene, cleaning house, washing clothes, etc.

Regarding practices of reusing water, we can state that this is widespread throughout the population of the seven *parajes* visited in both towns in the study. However, the population that has the most difficult access to regular water services and scarce access through the state give the most use to the resource. For example, the water they wash with is also used for plants or for the toilet; the water they bathe with is used to clean the house, the toilet, etc.

Chart 10. Origin of Water Reused by the Population

Original Use	Yes	No
Personal Hygiene	10	3
Washing Dishes	5	7
Clothes	7	5
Bathroom	12	4
Total	34	19

Chart 11. Destination of Reused Water

Destination of Water	Homes
Plants	4
Toilet	11
Street Cleaning	5
Total	20

4.3 Sanitation

The situation of sanitation in the seven *parajes* visited is also quite precarious. There was a drainage line installed in only two *parajes*, but even there the houses were not connected to the network. Most of the homes in these *parajes* have outhouses and some have septic tanks. One of the *parajes*, El Conejo in San Salvador, has a sewer used to directly discharge waste into the subsoil. As we noted in a previous report, this is an important factor of pollution in the Milpa Alta zone. The population is not conscious that this is a problem, and they state that the authorities of San Salvador suggested that they dispose of their waste this way.

Finally, there is a very small portion of the population that defecates in the open air, although we could venture that this is a practice still current in the most isolated and marginalized sectors of the population in the areas studied.

In the interviews we found the following:

Chart 12. Method for Disposing of Excrement

Method for Disposing of Excrement	Total
Outhouse	7
Septic Tank	4
Sewer	1
Open Air	1
No information	3
Total	16

Disposal of Garbage

In the seven *parajes* visited we noted the presence of the Borough garbage service, which means the garbage truck usually comes by once a week in the different *parajes* in San Bartolomé and in San Salvador. If the service takes longer than week, the population interviewed burns or buries their garbage.

5. CONCLUSIONS

Throughout this study we have tried to show how different forms of water management affect the living conditions of the population. A central point of this analysis is the relationship established between the living conditions of the population and the different methods used to access water. As has been noted, the conditions of the population of Milpa Alta are heterogeneous because of a series of characteristics related to the insertion of the local environment in social, economic, territorial, and political terms in a complex peri-urban context, marked by the close distance and relationship to the rest of the city, the processes of dismantling and parceling lands, and migration from different urban zones to the periphery of towns in Milpa Alta, with resulting pressure on resources and services. These processes are reflected by the characteristics of the population of the selected *parajes*, which generally show features of poverty and lack of access to basic services.

At the same time, the residents of *parajes* have diverse social and territorial origins. There are groups made up of the younger generations of the original settlers of the towns that have been displaced to these places looking for their own place to settle. Another group is made up of the families and children of old residents of these places, who occupied these lands for agriculture, but no longer do so. Finally, the group settled in what we call bought-and-sold *parajes* is made up of families from other boroughs in the Federal District.

In addition to the features mentioned, the characteristics of irregularity in the *parajes* mark the conditions for access to water in an important way, because if the settlement is irregular, they are not supposed to receive services from the authorities. However, an agreement has been established between the population and the authorities with a census to recognize one part of the population, who agreed not to allow population growth in exchange for services. On the part of the settlers, control of this agreement is complex and difficult and on the part of the authorities, the services provided are irregular.

As we have seen, in this context the diverse methods to access water are varied and two important elements have been detected to characterize these practices: the *actors involved in providing services*, which can be grouped into three classes: state, market and community. The other category, related to the *type of practice,* is differentiated between formal and informal practices. Those who are least disadvantaged have access to water through state/formal methods, with a signed agreement and a good relationship between the local political authorities and the community representatives. The most disadvantaged are those who only have access to water through the market or informal community methods.

Based on our analysis, we believe it is important to point out some aspects related to the population living in the *parajes* selected in San Bartolomé Cuauhtenco and San Salvador Xicomulco and their methods of access to water:

1. One important primary difference between the two towns is the fact that in San Bartolomé there is a higher level of formalization of access to water in the *parajes* visited. We did not find clandestine taps in any of them. All of the taps had been negotiated with the Borough authorities through the representatives and the Coordinator of Territorial Communications. In San Salvador, however, clandestine taps were the norm; in fact, none of the *parajes* had formal taps. This can be explained in part by the very history of the settlers and their connection to the Confederation of the Towns of Milpa Alta. San Salvador is the only town that still

has a dispute for recognition as a traditional town, even when there is a presidential resolution recognizing their property as communal. At the same time, it is possible that the leaders used by the paper mills to control the population and other local leaders settled in this town and therefore the practices of cooptation and corruption are even more widespread in the culture of the authorities and the population in general. In the interviews with the authorities of San Salvador and with the population, we could identify a double leadership in the town: authorities that were displaced in the last election of Territorial Coordinators and those that were elected by the population. Both maintained activities in the same offices. Another interesting indicator is the fact that clandestine taps are connected by the employees of the Coordination water system, the valve workers. The Borough as well as the Coordinators know this and know that the population pays these employees for them to connect a tap. Many times private individuals who have the resource and have a relationship with them do this, and on other occasions the leaders of the *parajes* do, increasing costs, since both the valve worker and the leader have to be paid.

2. In the case of San Bartolomé the relationship between *paraje* representatives and town authorities is much closer and frequent. In fact the three *paraje* representatives interviewed have radios with which to communicate with the Territorial Coordination offices which helps them in cases of emergency. We noted that when the Coordinator or some other authority could not accompany us on our field visits, they notified the representative by radio that we would go to interview them. On the other hand, in San Salvador the Coordination had no idea – or perhaps they did not want to inform us – who the representatives in the *parajes* were.

3. In the *parajes* of San Bartolomé everyone had a clear idea who the representative was and how she was elected. This situation was not as clear in the *parajes* of San Salvador, where they did not even have a very good image of them and accused them of clientelistic and preferential management of the population in relation to the incorporation to the Zero Growth Census and access to clandestine taps. This situation did not occur with the representatives of San Bartolomé. On the contrary, they were very careful to fulfill the Agreement of Zero Growth and organizing between settlers was more frequent to support the population for access to water. There were also conflicts here, but they were less evident.

4. Another important aspect that marks a difference between the two towns is that in the case of San Bartolomé, the most marginal area of the town with least access to services is made up of *parajes* inhabited by the descendents of *ejidatarios* or communal settlers who previously cultivated the lands, which are now divided up between their children and grandchildren. At the same time, much of the *ejido* and communal land has been sold through private contracts, as seen in the first report on Milpa Alta. In the case of San Salvador, the most marginal area is mostly inhabited by a migrant population from other southern boroughs of the city, who acquired the land from people who said they were the owners but in reality, there are others who claim to be owners, causing serious problems with the irregularity of land ownership.
5. An important point that we already mentioned is that the majority of the *paraje* representatives are women. The majority of them, with the exception of the Cuartoztitla representative, had been living in the *parajes* for between 10 and 20

years. In some cases they were the only representatives the *parajes* had had and the motive was that they had done their work well and they wanted to continue to do it. It is not an activity that excites much of the population, most of whom will criticize but have little interest in occupying the position. As mentioned, women stay at home and are in charge of receiving, storing, using, reusing, treating and caring for water. Men and children help with carrying water.

6. Two current cultures for using water were identified in general. One is closer to rural communities and one is more linked to urban methods. This can be explained by the origin of the population located in these zones from the beginning and those who have migrated from other parts of the city. This can be observed in the practices identified in use and reuse of water, in relation to the forest and collection of firewood, and in organization of crops, among other things.

7. Regarding sanitation, the *parajes* do not have drainage lines of any kind. In the two *parajes* where drainage lines did exist, the houses were not connected to them. The majority of the population has outhouses and very few have septic tanks. It is important to mention that the service of garbage collection really works in the entire borough and is generally regular.

8. A very small part of the population still maintains some agricultural practice. Some have small orchards or work in neighboring fields, which shows that the population in the *parajes* does not grow nopal or other crops. At the most, they are temporary agricultural workers.

9. As for the time dedicated to water by different families in the *parajes* visited, this took 3 or 4 hours a day, particularly the days the truck came or the valve to the tap was opened. For all of them, scarcity of water is a central preoccupation that should be solved.

10. The strongest impact on living conditions in the *parajes* is for the population that does not have tap or truck service by agreement. This population has to buy their water in jugs for drinking and cooking when they have money. A large plastic jug costs between 8 and 10 pesos. A small tank of 1500 liters of water costs 150 pesos. When they cannot buy water, they have to depend on their neighbors to give or lend them water. This sector of the population, which is the most economically vulnerable, is also the sector that in the end has to pay a higher price for water, as well as having to carry jugs to their *parajes* when they do not have transportation or they have had to pawn off their carts for lack of resources.

BIBLIOGRAPHY

Distrito Federal, "**Gaceta oficial del Distrito Federal**", México, abril de 1997.

Gomezcésar Hernandez Iván, **La palabra de los antiguos: territorio y memoria histórica en Milpa Alta**, at: www.df.gob.mx.

Gobierno del Distrito Federal, www.milpa-alta.df.gob.mx/milpa/economia.html.

Torres Lima, Pablo A., **El campesinado en la estructura urbana, su articulación y reproducción socioeconómica como estrategia de desarrollo regional en Milpa Alta, D.F.,** Tesis Maestría en Desarrollo Rural, UAM-Xochimilco, México, 1988.

46 internet sites on Milpa Alta were visited and the information was systematized.

APPENDIX

Interviews

A total of 17 families in 7 *parajes* were interviewed. 3 *parajes* were in San Bartolomé and 4 in San Salvador. The selection of *parajes* was carried out according to criteria stated in points 1.2 and 1.3 of this report, according to characteristics of water provided by the Borough. Later, in each *paraje*, families in homes inhabited at that time were interviewed. In-depth interviews were done in each home. The interview guide is attached.

The *parajes* and interviews were distributed in the following manner:

Characteristics of Water Supply	**San Bartolomé**	**San Salvador**
Water Truck with programmed stops	**Paraje Huicalco (5*, 6, 7)**	**Paraje Oluca (8, 9, 10)** **Paraje Tlatechalco (11, 12)** **Paraje Cuartoztitla (14, 15, 16, 17)**
Trucks by Request	**Paraje Apilintitla (1, 2)**	
No borough trucks – self support	**Paraje del Conejo (3, 4)**	**Paraje No Name (13)**

***Interview Number**

The person in charge of Milpa Alta Borough water trucks, the person in charge of the Borough Center of Services and Citizen Attention and private water vendors in San Salvador were also interviewed.

Systematization of Information

Two data bases were put together with the information from interviews: one qualitative and the other quantitative. The interviews were ordered by subject matter with the intention of recognizing the precise heterogeneity of the perceptions and practices of the population interviewed for access, use and management of water, as well as treatment and conservation of the environment. Despite the number of interviews -17-, we also decided to put together a quantitative data base in SPSS in order to be able to see the trends that could be profiled in the population interviewed more clearly, not in order to generalize about all *parajes*, but to derive some hypotheses that could enrich or orient the next phases of research.

Interview Guide for Users

1. SOCIO-DEMOGRAPHIC DATA

Characteristics of Interviewee

Name:

Age:

Sex:

Marital Status:

Education:

Place of birth:

Time residing in current location:

Occupation

-Last week did you work or carry out some activity for which you received payment in money or in kind?

-If so, at your job are you an employee, an independent worker, a non-paid worker, manager or entrepeneur, or other? (specify).

-If you have not worked in the last week, did you work on your land or in your family business without receiving payment?

-Do you realice any other activity in addition to those mentioned, such as planting, raising animals, foresting, selling some kind of product, etc.? What? (FOR THESE ACTIVITIES APPLY SPECIAL SECTION)

-Can you tell me how much is your approximate weekly/monthly income?

-Can you tell me your approximate weekly/monthly expenses?

Domestic Unit

- How many people normally live in this house (including children and elderly people).

- How many families live in this house (that separate food expenses)

For family members:

Family Member	Place of Birth	Sex	Age	Marital Status	Education	Occupation	Jobs in Last Year	Lives at Home or No	Receives Income	Contributes to the home income

2. CHARACTERISTICS OF THE HOME AND *PARAJE*

Housing Materials and Characteristics

- What is the total number of rooms in the house, not counting the bathroom and the kitchen?

- What is the floor mostly made of? (dirt, cement, wood or others)

- Do the residents of this home have: bathroom, outhouse, septic tank; black hole or cesspool, or no sanitary service.

- Where is the bathroom / outhouse or what corresponds? Outside / inside the house

- Where is the septic tank?

- What services does the house have (electricity, water, gas)?

Ownership and Process of Settlement

- Is your house: rented, owned, transferred, lent, or other?

- How long have you been here?

- Was your last home rented, owned, transferred, lent, or other?

- How did you get here? (Process of Settlement. Family, bought, rent, etc.)

- What are the main changes that have been made in access to different services? (electricity, water, gas, pavement, garbage)

- Do you know if there is an agreement with the authorities for granting services? (try to inquire here about the Agreement of Zero Growth)

3. WATER AND SANITATION

Water Sources

- How is the community supplied with water? (river, well, water wheel, spring, pond, pool, reservoir, rainwater, water trucks, other) State the name and the location of the source of supply.

- Is the source of water supply protected in this community? How?

- Is there anyone who cleans or fixes up and takes care of this source? If so, how often is the water serviced?

- Are there problems with this source? What problems? How could they be solved?

Quality and Purification of Water

- How is the water you drink? What color is it? What does it taste like?

- Do you drink the water just the way it comes? (If so, explore knowledge of purification practices).

- How do you prepare your food?

- Do you consider the water to be good quality? Why?

- In general, do you consider the water to be sufficient? Why?

- Has anyone in your family gotten sick because of the water?

- Have you received any information or talks about hygiene, health and care of water? If so, who gave these talks?

Water Use:

TYPE OF SOURCE	RECEIVES YES/ NO	HOW OFTEN (temporality)	HOW IT IS CARRIED	WHERE IT IS STORED
TAP				
BOROUGH TRUCK				
PRIVATE TRUCK				
COLLECTION OF WATER				
BROUGHT FROM OTHER SOURCE				
BROUGHT FROM OTHER SOURCE				

TYPE OF SOURCE	WHO IS IN CHARGE OF BRINGING THE WATER	HOW LONG IT TAKES	WHAT USE IT IS GIVEN	HOW MUCH IT COSTS	
TAP					
BOROUGH TRUCK					
PRIVATE TRUCK					
COLLECTION OF WATER					
BROUGHT FROM OTHER SOURCE					
BROUGHT FROM OTHER SOURCE					

Method of Reusing Water / Waste

	Water is reused: Yes/no	Where it is used	Where it is dumped	How it is dumped (pipes /carrying / direct)
Bath (shower)				
Dishes				
Clothes				
Toilet / Outhouse				
Plants				
Other				

Management of Waste

- What do you do with your garbage?

- Do you separate, select, recycle, etc.?

- Do you make compost? How do you make it and what do you use it for?

4. ORGANIZING AND INSTITUTIONAL RELATIONS

Methods of Organizing in the Street or Paraje

- Do you participate in some association or sports group, neighbor committee, religious group, cultural center, or group of producers, vendors, *ejidatarios* or communal members?

- How is the *paraje* organized? Are there neighbor committees? Service committees?

- How do you make demands to the coordinators of communications? And to the Borough?

- What are the main organizations in the *paraje*?

- Are there organizations related to water, environment or use of treated water?

Water and Service Organizations

- Is there some way in which the neighbors are coordinated to solve water problems?

- How do they relate to the authorities to solve the water problem?

- What solutions have been proponed by the authorities to solve the water problem?

- One Borough authority told us that sometimes constructions are built with the neighbors to solve some water problems such as supply. Do you know of any experiences like this?

Conflicts and Forms of Protest

- What are the main problems in the *paraje*?

- How are they resolved?

- How do the *paraje* residents manifest their demands?

- How are the relations between the neighbors and the coordinator? And with the Borough?

5. LOCAL ECONOMIC ACTIVITIES (for those involved in agriculture or foresting)

Agricultural Activities

- Are you the owner, or do you rent or borrow land to plant? What do you plant? What do you do with the products?

- If you plant, how do you make the furrows in the ground? (Straight or adapted to the land, leveled curves).

- Do you plant crops together or alone?

- Do you change crops in one plot from one cycle to the next?

- What kind of seeds do you use? Where do you get them? How much do they cost? How do they work?

- Do you use herbicides, insecticidas, fungicides, etc? Which ones do you use? When do you use them? How much?

- How do you irrigate? With what water do you irrigate? How do you get water for irrigation? Is it sufficient?

- How do you harvest? What do you do with the stubble field?

- Does the land rest before the next cultivation?

- After each cycle, do you change crops? What crop do you plant after what crop? (For example if you plant corn, what do you plant next?)

- Who helps you with agricultural labor? Do you hire workers to work on plots? For what jobs?

- Does your family help you with the plot? How many members of your family help you? Do you pay them a salary?

- Do you have animals? What kind? What will they be used for?

- If you have yard animals (chickens, hens, pigs, geese, etc.), what will they be used for? Si

Foresting Activities

- Is their wilderness or forest in your community?

- What kind of trees are there?

- Do you use the trees? Which ones? For what?

- Does anyone help you carry out this task?

- Do you sell wood? What kind?

- How much do you charge?

- Is the sap used? For what purpose?

- In the forest or wilderness are there medicinal plants? Which ones? Are there mushrooms? etc.

- Do you collect these products? (clarify if it is for personal use or commercialization).

- What are the main problems you confront for foresting?

- What is the firewood used for? What trees make firewood? Where do you collect it and deposit it? How much firewood does one family need?

- Do you believe there is a depletion of the wilderness? What plants are becoming extinct?

- Are there any reforestation practices? Who does this?

- How do you know when a species is in danger? What measures are taken? What agencies do you go to?

- Is there an authority that watches out for overexploitation of the wilderness? How do they do this?

- Is there clandestine logging? Who does it?

- Are there problems of deforestation? Why? What would be the solution?

- What are the main problems affecting the wilderness?

- What use do you think the wilderness has for the community?